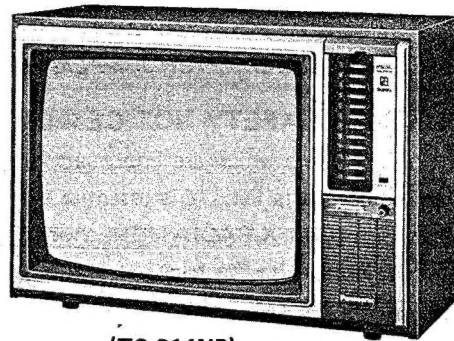
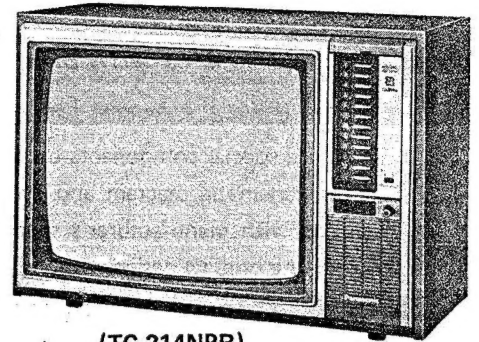


Service Manual

Color Television TC-214NP/TC-214NPR Chassis No. RBX-M11E



(TC-214NP)



(TC-214NPR)

The service technician is required to read and follow the "Safety Precautions" and "Important Safety Notice" in this service manual.

Specifications

Power Source:	AC 120—240 V, 50/60 Hz
Power Consumption:	TC-214NP 83 W TC-214NPR 90 W
Antenna Impedance:	300Ω balanced type for UHF, VHF 75Ω coaxial type for VHF
Receiving Channels:	NTSC 2-13, (VHF), 14-83 (UHF) PAL 2-12 (VHF), 21-69 (UHF)
Receiving Systems:	NTSC-M, PAL-B, G, I
Intermediate Frequency:	Video I-F carrier 38.0 MHz Sound I-F carrier 32.0 MHz (PAL I) 32.5 MHz (PAL B, G) 33.5 MHz (NTSC) Color sub carrier 33.57 MHz (PAL) 34.42 MHz (NTSC)
Semiconductors:	TC-214NP TC-214NPR
Transistors	28 39
Diodes	81 88
Posistor	1 1
Integrated Circuit	10 12

Audio Output:	2 W (10 % Distortion)
Speaker:	4 inches Round, 16Ω
Picture Tube:	19 inches measured diagonal
High Voltage:	23.3 kV + 1.5 kV — 1.3 kV
Automatic Circuit:	Automatic Fine Tuning Automatic Gain Control Automatic Color Control Automatic Frequency and Phase Control Horizontal-AFC Automatic Beam Current Limiter Automatic Degussing
Dimensions:	Height 42.8 cm (16-27/32 inches) Width 63.7 cm (25-3/4 inches) Depth 47.4 cm (18-21/32 inches)
Weight:	25.5 kg (50-21/32 lbs.)

Weight and dimensions shown are approximate.

Specifications are subject to change without notice.

Each line should have more resistance than the line below it.

Panasonic®

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THESE MODELS COMPLY WITH DHHS RULES 21 CFR SUBCHAPTER J APPLICABLE AT DATE OF MANUFACTURE.

IMPORTANT SAFETY NOTICE

There are special components used in Panasonic TV sets which are important for safety. These parts are shaded on the schematic diagram and on the replacement parts list. It is essential that these critical parts should be replaced with manufacturer's specified parts to prevent X-RADIATION, shock, fire, or other hazards. Do not modify the original design without permission of Matsushita Electric.

ABBREVIATIONS USED IN THIS MANUAL

ABL Automatic Beam Limiter
 ACC Automatic Color Control
 AGC Automatic Gain Control
 AFT Automatic Fine Tuning
 APF Active Power Filter
 APC Automatic Phase Control

AVR Automatic Voltage Regulator
 CRT Cathode Ray Tube
 DY Deflection yoke
 FBT Flyback Transformer
 OTL Output Transformerless
 SEPP Single-Ended Push-Pull Circuit

SAFETY PRECAUTIONS

GENERAL GUIDELINES

1. It is advisable to insert an isolation transformer in the power line and AC supply before servicing a hot chassis.
2. When servicing, observe the original lead dress, especially the lead dress in the high voltage circuits. If a short circuit is found, replace all parts which have been overheated or damaged by the short circuit.
3. After servicing, see to it that all the protective devices such as insulation barriers, insulation papers, shields, and isolation R-C combinations, are properly installed.
4. Before turning the receiver on, measure the resistance between B+ line and chassis ground. Connect \ominus side of an ohmmeter to the B+ lines, and \oplus side to chassis ground. Each line should have more resistance than specified, as follows:
5. When the TV set is not to be used for a long period of time, unplug the power cord from the AC outlet.

B+ Line	Minimum Resistance
190V	100k Ω
111V	20k Ω
14V	300 Ω
12V	100 Ω

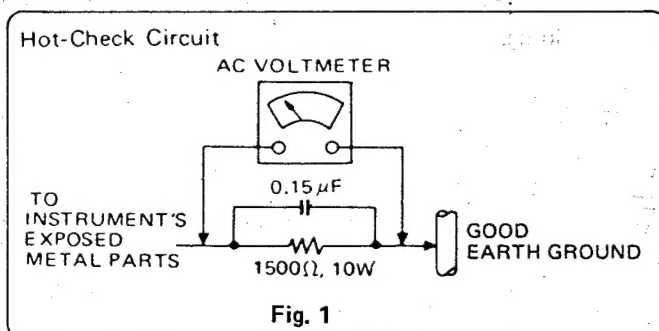
6. Potentials, as high as 24.8 kV are present when this receiver is in operation. Operation of the receiver without the rear cover involves the danger of a shock hazard from the receiver power supply. Servicing should not be attempted by anyone who is not thoroughly familiar with the precautions necessary when working on high-voltage equipment. Always discharge the anode of the picture tube to the receiver chassis before handling the tube.
7. After servicing make the following leakage current checks to prevent the customer from being exposed to shock hazards.

LEAKAGE CURRENT COLD CHECK

1. Unplug the AC cord and connect a jumper between the two prongs on the plug.
2. Turn on the receiver's power switch.
3. Measure the resistance value, with an ohmmeter, between the jumpered AC plug and each exposed metallic cabinet part on the receiver, such as screwheads, antennas, control shafts, handle bracket, etc. When the exposed metallic part has a return path to the chassis, the reading should be between 240 k Ω and 5.2 M Ω . When the exposed metal does not have a return path to the chassis, the reading must be ∞ .

LEAKAGE CURRENT HOT CHECK (See figure 1.)

1. Plug the AC cord directly into the AC outlet. Do not use an isolation transformer for this check.
2. Connect a 1.5 k Ω , 10 watts resistor, in parallel with a 0.15 μ F capacitor, between each exposed metallic part on the set and a good earth ground such as a water pipe, as shown in figure 1.
3. Use an AC voltmeter, with 1000 ohms/volt or more sensitivity, to measure the potential across the resistor.
4. Check each exposed metallic part, and measure the voltage at each point.
5. Reverse the AC plug in the AC outlet and repeat each of the above measurements.
6. The potential at any point should not exceed 0.75 volts RMS. A leakage current tester (Simpson Model 229 or equivalent) may be used to make the hot checks, leakage current must not exceed 1/2 milliamp. In case a measurement is outside of the limits specified, there is a possibility of a shock hazard, and the receiver should be repaired and rechecked before it is returned to the customer.



X-RADIATION

WARNING: 1. The potential source of X-Radiation in TV sets is the High Voltage section and the picture tube.

2. When using a picture tube test jig for service, make sure that jig is capable of handling 29.5 kV without causing X-Radiation.

NOTE: It is important to use an accurate periodically calibrated high voltage meter.

1. Turn the Brightness control fully counterclockwise.
2. Set the SERVICE switch to SERVICE.
3. Measure the High Voltage. The upper meter (electrostatic type) reading should indicate 23.3 kV ± 1.5 kV. If the upper meter indication is out of tolerance, immediate service and correction is required to prevent the possibility of premature component failure.
4. To prevent an X-Radiation possibility, it is essential to use the specified picture tube.
5. To prevent exposure to X-Radiation, the picture tube shield must be kept in place with power applied to the set.

HORIZONTAL OSC. DISABLE CIRCUIT TEST

This test must be made as a final check before the set is returned to the customer.

1. With the rear cover removed, supply a nominal 120V AC to the set, turn on the power switch.
2. Set the customer controls to normal operating positions.
3. Short between TPS10 on the main board and TPB12 on the (B) board with a jumper lead. Confirm that picture is black out.
4. If this does not occur, the horizontal oscillator disable circuit is not operating.
Follow instructions below for repair procedures before the set is returned to customer.

REPAIR PROCEDURES OF HORIZONTAL OSCILLATOR DISABLE CIRCUIT

1. Connect a DC voltmeter between TPS1 on the main circuit board and chassis ground.
If nearly +111V is not present on that point, find the cause. Check D831, D806, and IC801.
2. Connect a DC voltmeter between TPS10 on the main board and chassis ground.
If nearly +10.7V is not present on that point, check R508, R509, R518, C509, D501 and IC501.
3. Carefully check above specified parts and related circuits and parts. When the circuit is repaired, horizontal oscillator disable circuit test must be made again.

DISASSEMBLY INSTRUCTIONS

Proceudre	Block	Remove	Shown in Fig.
1	Rear Cover	Screws (A) x 7	2
2	Tuning	Screws (B) x 2 (4)	3
3	Speaker	Screws (C) x 4	3

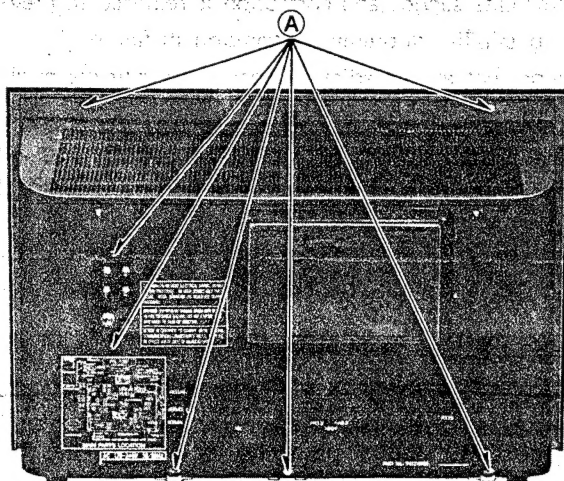


Fig. 2

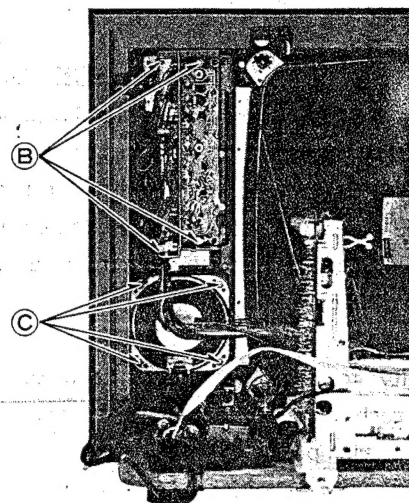


Fig. 3

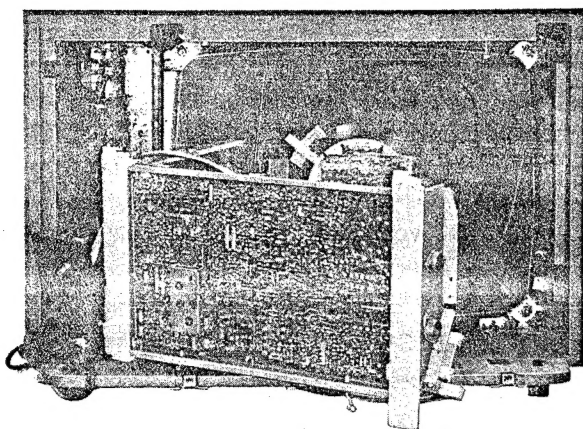


Fig. 4

Note: During servicing, it is desirable to put the receiver at the service position for easier servicing as shown in fig. 4.

FIELD ALIGNMENT

NO SPECIAL TEST EQUIPMENT REQUIRED

Alignment is normally made according to the general procedure.

For your information, the following describes simple alignment methods for which you use accurate meter and jumpers.

SUB-BRIGHT ADJUSTMENT

1. Connect the negative side of the VOLT OHM METER (3mA full scale range) to the TPS7 on E-Board, and the positive side to ground.
2. Receive Philips pattern.
3. Set the brightness control (R342) and contrast control (R340) to maximum. Set the color control (R671) to minimum.
4. Adjust sub brightness control (R559) to the reading of $1400\mu A$.

SOUND I-F ADJUSTMENT

1. Receive picture signal.
2. Receive relatively strong picture signal and turn the core of L201 within 2 turn until the maximum volume is obtained with the least buzz.
3. After the above adjustment, make sure of the above at all channels.

RF AGC CONTROL ADJUSTMENT

1. Receive normal picture signal.
2. Slowly turn the RF AGC control (R119) clockwise from where it was fully turned counterclockwise and set it at a point where noise is minimized.
3. Receive picture on all channels, and make sure that neither synchronize distortion nor cross modulation takes place.

AFC ADJUSTMENT

1. Receive normal picture signal.
2. Turn the core of L151 until the drawing of normal local frequency is obtain while watching the picture.

VERTICAL CIRCUIT ADJUSTMENT

1. Receive a color picture signal.
2. Adjust V-Hold controls R407 (PAL), R480 (NTSC) to achieve a stable picture.
3. Adjust V-Height controls R409 (PAL), R483 (NTSC) to obtain a normal picture.
4. Change the position of chips (E35 ~ E38) so that the picture is centered on the screen of the picture tube.

HORIZONTAL CIRCUIT ADJUSTMENT

1. Adjust H-Hold controls (R506 (PAL), R530 (NTSC) to achieve a stable picture.
2. Adjust the H-Center control (R517) so that the picture is centered on the screen of the picture tube.
3. Adjust the Bias control (R757) to obtain a normal picture.

POWER LINE CIRCUIT

1. Set the brightness control (R342) and contrast control (R340) to minimum position.
2. Connect VTVM between TPS1 and ground.
3. Adjust +B Adj. control (R811) to the reading of $113V \pm 1V$.

HEIGHT VOLTAGE ADJUSTMENT

1. Set the brightness control (R342) and contrast control (R340) to minimum position.
2. Connect high voltage meter (electrostatic type) to the anode of CRT and confirm that high voltage is within a range of $23.0 kV + 1.5 kV - 1.3 kV$.
3. If it's lower or higher, slightly adjust +B Adj. control (R811).

FOCUS ADJUSTMENT

Adjust Focus control (on F.B.T) to obtain a sharpest and clearest picture.

SERVICING ADJUSTMENT

COLOR PURITY ADJUSTMENT (See Fig. 5) **BEFORE ALL ADJUSTMENTS DESCRIBED BELOW ARE ATTEMPTED, V-HOLD, H-HOLD, V-HEIGHT, V-LINEARITY, B+ VOLTAGE AND FOCUSING ADJUSTMENTS MUST BE COMPLETED.**

1. Place the TV receiver facing NORTH or SOUTH.
2. Plug in TV receiver and turn it ON.
3. Operate the TV receiver over 10 minutes.
4. Fully degauss the TV receiver by using an external degaussing coil.
5. Receive a crosshatch pattern and adjust the static convergence control roughly.
6. Loosen the clamp screw of the deflection yoke and pull the deflection yoke toward you.
7. Fully turn the blue and red low light controls (R359, R361) counterclockwise and set the green low light control (R360) to its mid position.
8. Adjust the purity magnets so that green field is obtained at the center of the screen.
9. Slowly push the deflection yoke toward bell of CRT and set it where a uniform green field is obtained.
10. Tighten the clamp screw of the deflection yoke.

COLOR TEMPERATURE ADJUSTMENT (See Fig. 5)

1. Tune into black and white program.
2. Set all three low light controls to 45° turn clockwise from its counterclockwise position.

Note: a) If the illumination becomes too strong turn brightness control down.

b) Do not touch screen control, it is factory preset.

3. Set service switch (S301) to SERVICE position.
4. Turn contrast (R340) and brightness (R342) controls until first horizontal color line just illuminate on CRT.
5. Turn rest of two color's low light control until all three colors for equal level.
6. Set service switch (S301) back to NORMAL position.

7. Adjust drive controls (R354, R355) to achieve white raster at high brightness level.
8. Repeat steps 3 to 7 as necessary.

If the screen control (R371) is turned by mistake or it becomes necessary take following steps.

1. Receive a black and white picture signal.
2. Turn the blue, green and red low light controls (R359, R360, R361) to mid position.
3. Turn the screen control (R371) fully counterclockwise. Set the service switch (S301) to SERVICE position.
4. Set sub brightness control (R559) to mid position and set contrast (R340) and color (R671) controls to minimum position.
5. Turn the receiver ON.
6. Connect VTVM between TPY1 and earth, then adjust brightness control (R342) to the reading of +150V DC.
7. Slowly turn the screen control clockwise to the point where one of the three beams just illuminates.
8. Leave the low light control of the color which appeared at the step 5 as it is, and turn the remained two low light controls clockwise, from the setting position at the step 5, so as to get a white horizontal line on the picture tube.
9. Reset the service switch to NORMAL position.
10. Adjust red and blue drive controls to obtain a uniform white raster.
11. Check the black and white picture detail for proper black and white rendition (No coloration) from low-lights to highlights and at all brightness levels for proper tracking.

Proper tracking at all brightness levels can be obtained when the screen control, low light controls and drive controls are properly adjusted. If the results are unsatisfactory, repeat from the beginning.

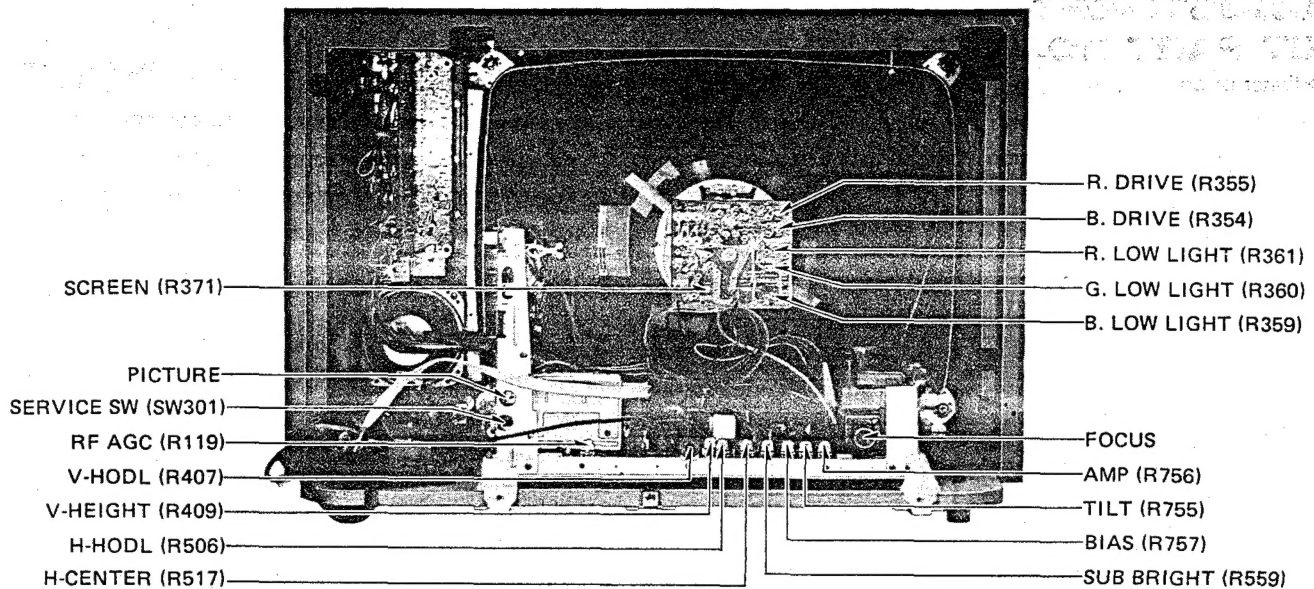


Fig. 5

CONVERGENCE ADJUSTMENT (See Fig. 6)

1. Receive a dotted pattern.
2. Unfix the convergence magnet clumper and align red with blue dots at the center of the screen by rotating (R, B) Static convergence magnets.
3. Align red/blue with green dots at the center of the screen by rotating (RB-G) static convergence magnet.
4. Fix the convergence magnets by turning the clumper.
5. Remove the DY wedges and slightly tilt the deflection yoke horizontally and vertically to obtain the good overall convergence.
6. Fix the deflection yoke by wedges.
7. If purity error is found, follow "Purity Adjustment" instructions.

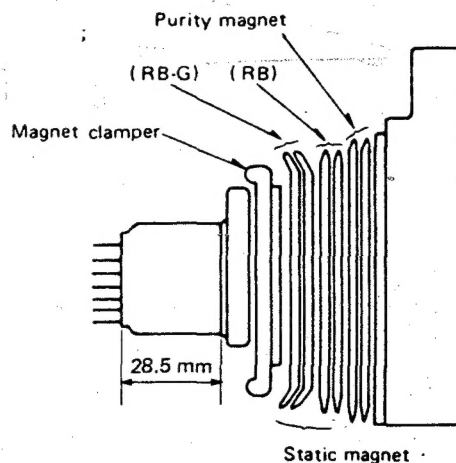


Fig. 6

RUBBER REPAIRING KIT FOR DEFLECTION YOKE ADJUSTMENT KIT PART NO. (TZF70302)

• Description

This repairing kit is used for adjusting purity and convergence when deflection yoke and picture tube are replaced.

• Parts

Code	Shape	Q'ty	Description
Ⓐ		3	Adjusting rubber
Ⓑ		3	Tape
Ⓒ		1	Tape
Ⓓ		1	Silicone adhesive tube

• How to use

Deflection yoke and picture tube replacement.

(For picture tube replacement, see number 2 below.)

1. Remove defective deflection yoke and old parts Ⓐ, Ⓑ, and Ⓒ from the picture tube.
2. Apply new part Ⓒ to the required place in the picture tube.
3. Insert new deflection yoke and static magnet into the picture tube.
4. Adjust the purity and convergence, referring to the setting and adjusting procedures.
5. Apply silicone adhesive to part Ⓐ using Ⓓ as shown in fig. 7. After removing the separator from part Ⓐ, insert part Ⓐ between picture tube and deflection yoke, and install the deflection yoke firmly.
6. Apply the tape Ⓑ over the part Ⓐ.

(Reference Figures)

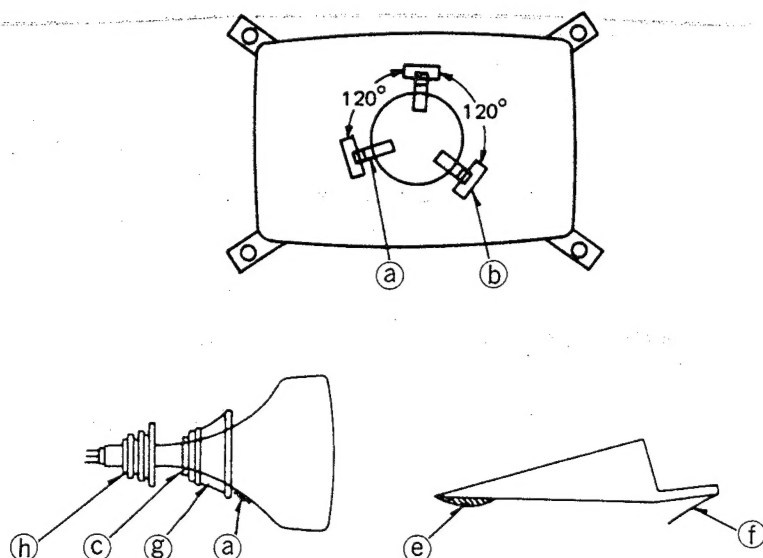


Fig. 7

Code	Description
Ⓔ	Silicone adhesive
Ⓕ	Separator
Ⓖ	Deflection yoke
Ⓗ	Static magnet

GENERAL ALIGNMENT

CARRIER TRANSFORMER AND RESONANCE COIL ALIGNMENT

Preparation Step (See Fig. 8)

1. Supply AGC bias voltage to TPA2.
2. Connect output lead of VIF sweep generator between TPA1 and shield case.
3. Connect lead of FROM REC. between TPA12 and shield case.

4. Supply DC 14V to TPS5.
5. Turn the RF AGC control (R119) fully clockwise.
6. Set system switch to PAL position.
7. Supply DC 18V to TPB12.
8. Set system SW to PAL 5.5 MHz position.

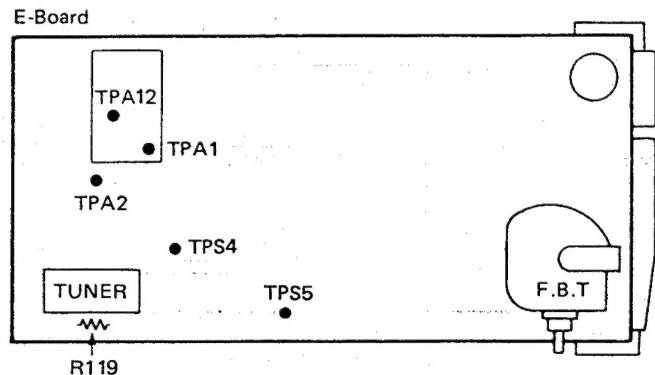
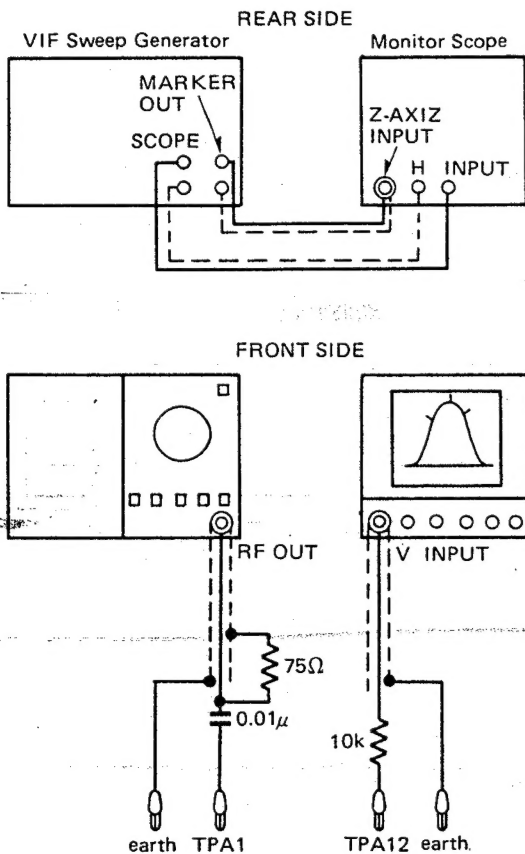


Fig. 8

Alignment Step

1. Set AGC bias voltage at point where stabilized waveform with the minimum noise is obtained.
2. Adjust the level of sweep generator to obtain 1Vp-p output as in Fig. 9.
3. Adjust L104 for maximum amplitude around P.C. (Picture carrier 38.0 MHz)

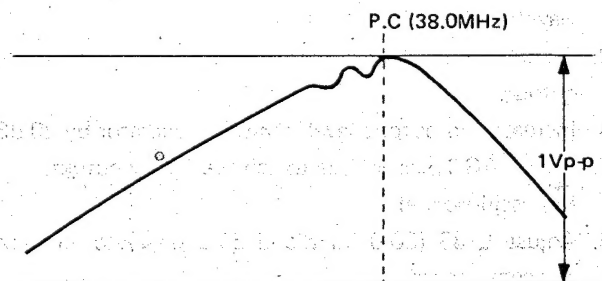


Fig. 9

VIF ALIGNMENT

Preparation Step (See Fig. 10)

1. Earth BS and RF AGC terminal (No. ③ and ④ pin) of tuner.
2. Turn the RF AGC control fully clockwise.
3. Supply AGC bias voltage to TPA2.
4. Connect output lead of VIF sweep generator to tuner test point TP.
5. Connect lead of FROM REC. between TPA12 and shield case.

6. Connect resistor jumper (100Ω) between TPA3 and TPA4.

7. Supply DC 14V to TPS5 and supply DC 18V to TPB12.

8. Set channel setting switch to OFF position.

Note: All cores of transformers are required to be adjusted with respective upper side position.

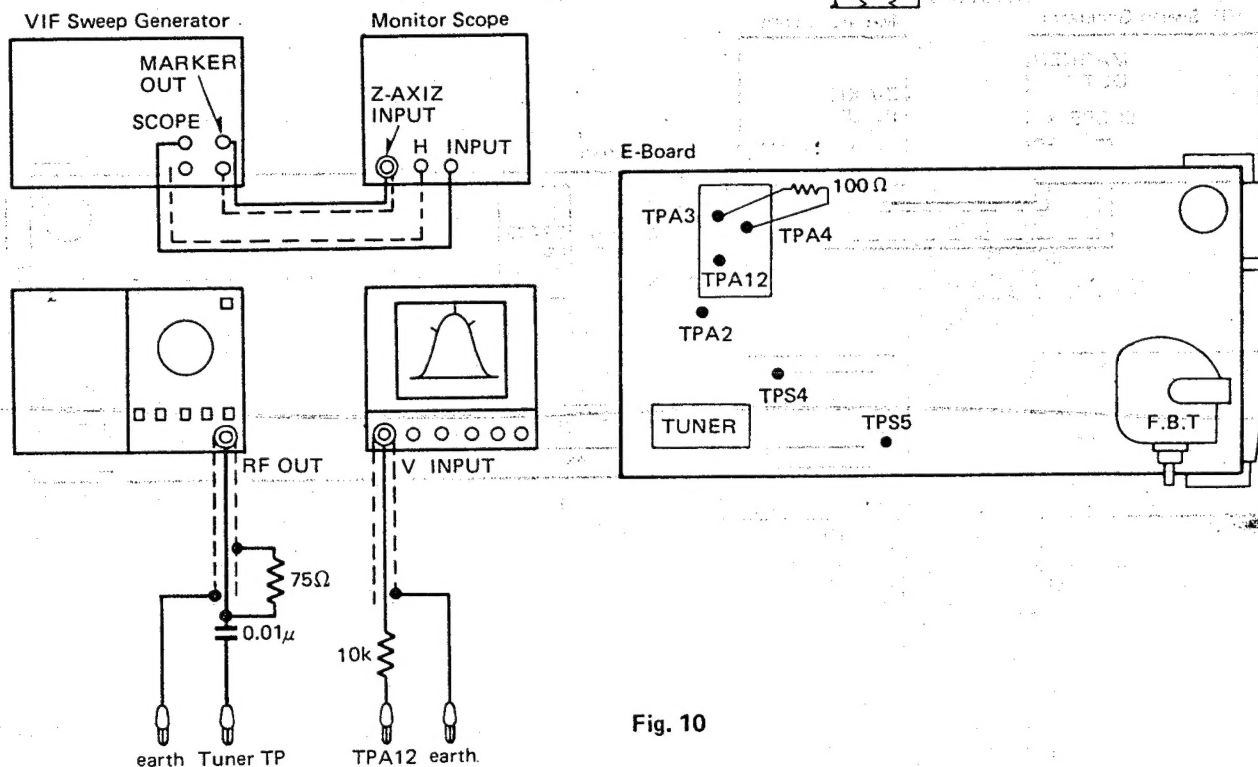
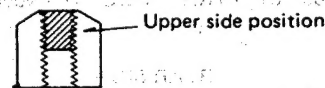


Fig. 10

Alignment Step

1. Set system switch to PAL 6.0 MHz position.
2. Adjust AGC bias voltage for maximum amplitude of waveform.
3. Adjust the level of sweep generator to achieve 1Vp-p output.
4. Increase the output level of sweep generator by 20 dB.
5. Adjust AGC bias voltage to achieve 1Vp-p output. (on oscilloscope)
6. Adjust L133 (30.0 MHz and 39.5 MHz) to minimize adjacent carrier.
7. Set system switch to PAL 5.5 MHz position.
8. Adjust L170 to minimize adjacent carrier (31.0 MHz).
9. Set system switch to NTSC position.
10. Adjust T130 to achieve 1Vp-p output to minimize adjacent carrier 32.0 MHz.
11. Set system switch to PAL 5.5 MHz position.

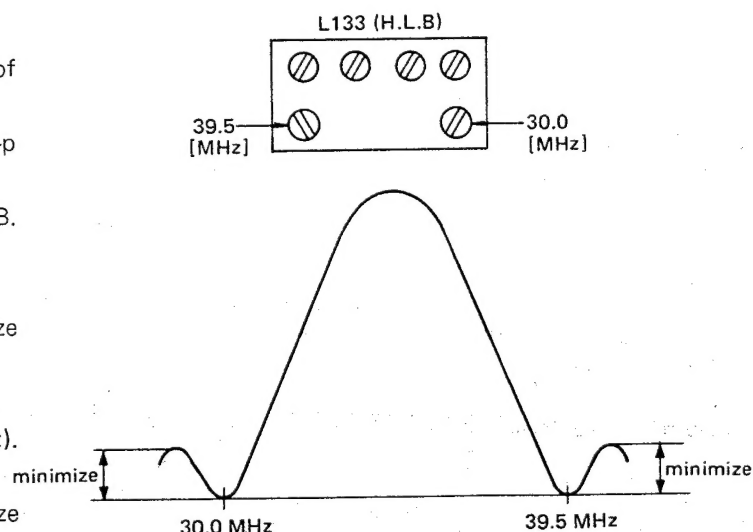
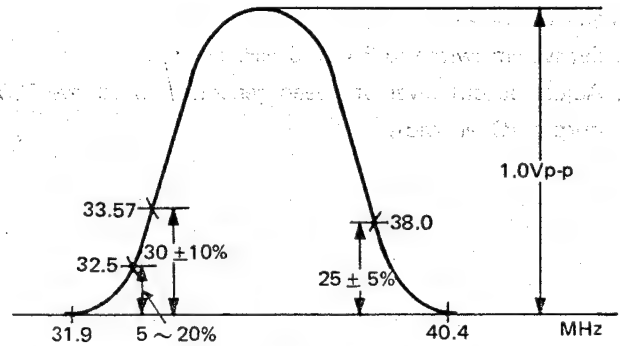
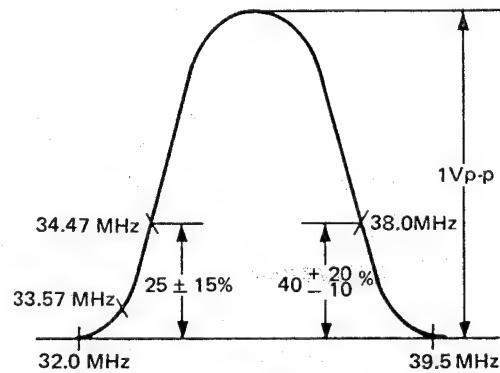


Fig. 11

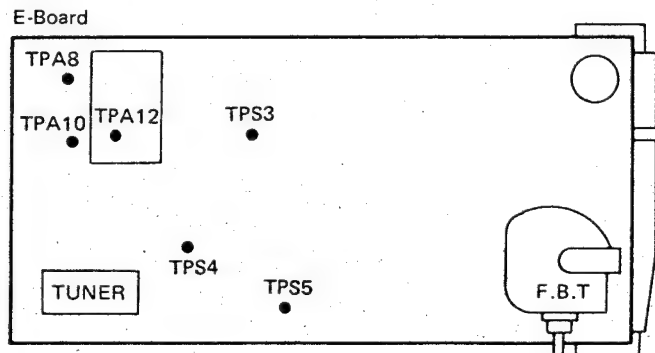
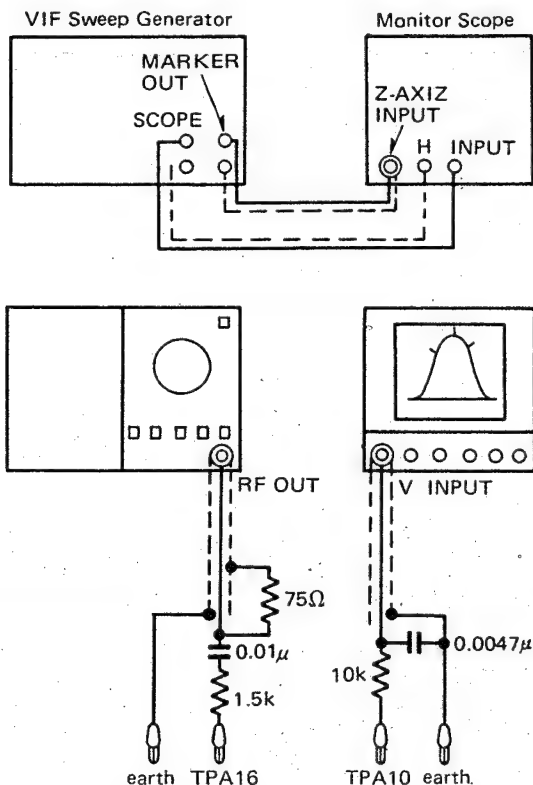
12. Increase the output level of sweep generator to achieve 1Vp-p output.
13. Adjust tuner converter coil to obtain the waveform as in fig. 12.
14. Set system switch to NTSC position.
15. Adjust AGC bias voltage for maximum amplitude of waveform.
16. Adjust the level of sweep generator to achieve 1Vp-p output.
17. Increase the output level of sweep generator by 12 dB.
18. Adjust AGC bias voltage to achieve 1Vp-p output.
19. Observe the position of picture carrier 38.0 MHz (30%).
20. Increase the output level of sweep generator by 12 dB.
21. Adjust T131 to obtain the 33.57 MHz.
22. Decrease the output level of sweep generator by 12 dB.
23. Observe the waveform as in fig. 13.


Fig. 12

Fig. 13

SIF ALIGNMENT

Preparation Step (See Fig. 14)

1. Connect output lead of SIF sweep generator between TPA16 and earth.
2. Connect input lead of oscilloscope between TPA10 and earth.
3. Supply DC 16V to TPS3 and supply DC 14V to TPS5.
4. Supply DC 18V to TPB12.
5. Connect capacitor jumper ($1\mu\text{F}/50\text{V}$ (NP)) between TPA12 and earth.
6. Supply AGC bias voltage.


Fig. 14

Alignment Step

1. Set system switch to PAL 6.0 MHz position.
2. Adjust output level of sweep generator to achieve 700 mVp-p (Open end).

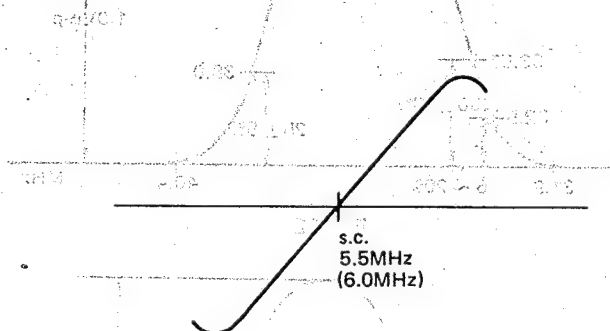


Fig. 15

5. Set system switch to PAL 5.5 MHz position.
6. Adjust C277 so that sound carrier 5.5 MHz is centered as in fig. 16.
7. Set system switch to NTSC position.
8. Change the sweep generator with 4.5 MHz sweep generator.
9. Adjust C274 to obtain the waveform as in fig. 17.

3. Adjust L201 so that sound carrier (6.0 MHz) is centered as in fig. 15.
4. Observe the waveform as in fig. 16.

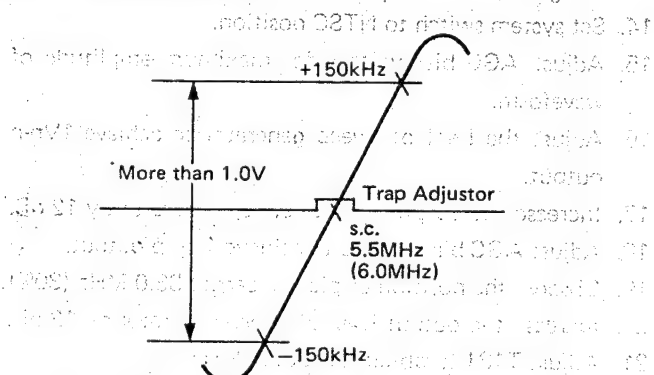


Fig. 16

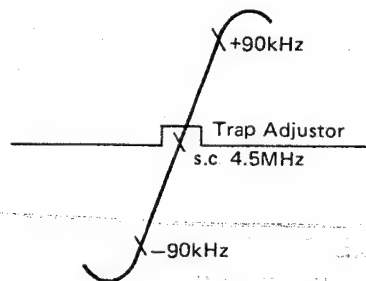


Fig. 17

CHROMA ALIGNMENT (PAL)

HIGH PEAKER TRANSFORMER ALIGNMENT

Preparation Step

1. Connect output lead of chroma sweep generator to tuner test point.
2. Connect output lead of detector to TPB8.
3. Supply DC 14V to TPS5.
4. Supply AGC bias voltage to TPA2.
5. Connect resistor jumper (100Ω) between TPA3 and TPA4.
6. Connect short jumper between Bs terminal of tuner and earth.
7. Set controls as follows.
Color control (R671) Maximum position
Sub color control (R635) Mid. position
DL control (R623) Mid. position
Channel preset switch Preset position
System switch. PAL 5.5 MHz position
8. Supply DC 18V to TPB12.
9. Connect short jumper between RF AGC terminal of tuner and earth.
10. Connect resistor jumper (100Ω) between TPB2 and TPB4.
11. Set select switch of chroma sweep generator to 38.0 MHz position.
12. Set select switch of chroma sweep generator to 5.5 MHz position.

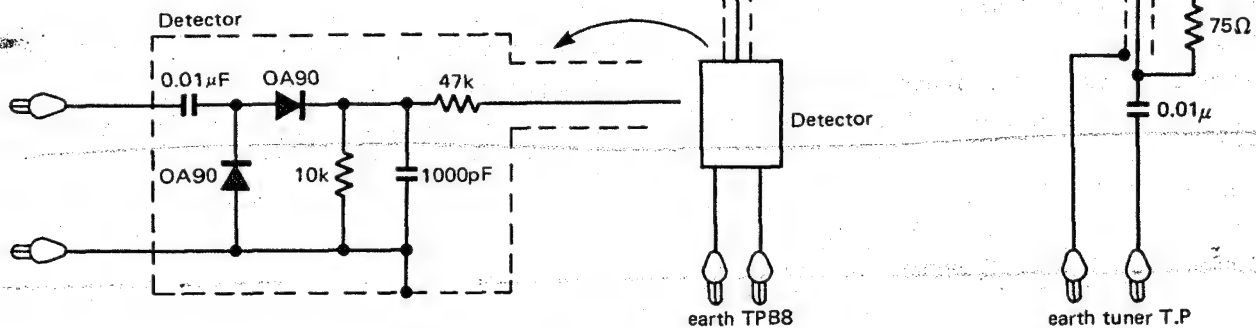


Fig. 18

Alignment Step

1. Adjust AGC bias voltage to obtain the maximum output.
2. Adjust output level of chroma sweep generator to achieve 0.2Vp-p.
3. Increase the output level of sweep generator by 20 dB.
4. Adjust AGC bias voltage to achieve 0.2Vp-p.
5. Adjust T601 to obtain the waveform as in fig. 19.

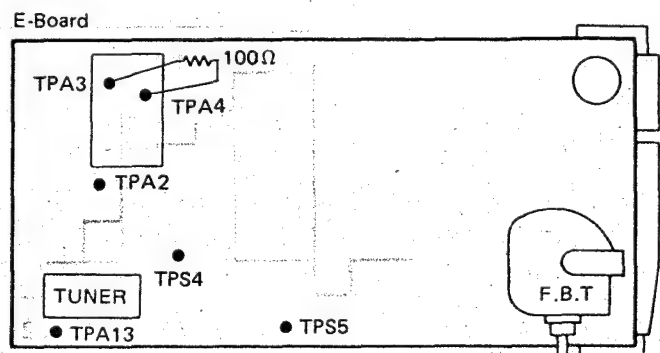
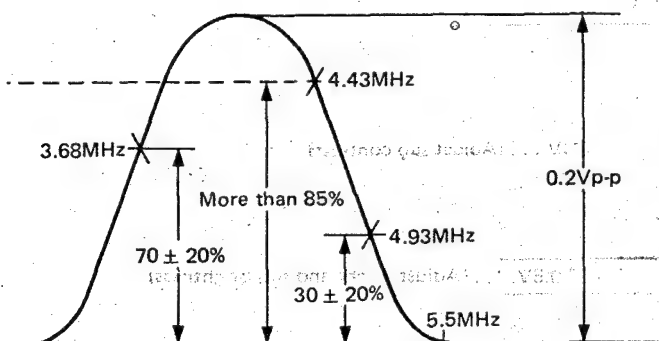


Fig. 19

CHROMA ALIGNMENT (NTSC)

Preparation Step

1. Connect output lead of chroma sweep generator to tuner test point.
2. Set select switch of chroma sweep generator to IF position.
3. Supply DC 14V to TPS5.
4. Connect output lead of detector to TPB12.
5. Supply AGC bias voltage to TPA2.
6. Connect resistor jumper (100Ω) between TPA3 and TPA4.
7. Set channel setting control to VHF high position.
8. Connect short jumper between RF AGC terminal of tuner and earth.
9. Connect short jumper between BS terminal of tuner and earth.
10. Set controls as follows.

Channel setting switch Preset position
System switch. NTSC position
DL control (R623) Mid. position
NTSC Tint control (R616) Mid. position

11. Supply DC 18V to TPB12.
12. Connect resistor jumper (100Ω) between TPB2 and TPB4.

Alignment Step

1. Adjust AGC bias voltage -20 dB from the maximum gain.
2. Adjust output level of chroma sweep generator to achieve 0.2Vp-p.
3. Adjust T602 to obtain the waveform as in fig. 20.

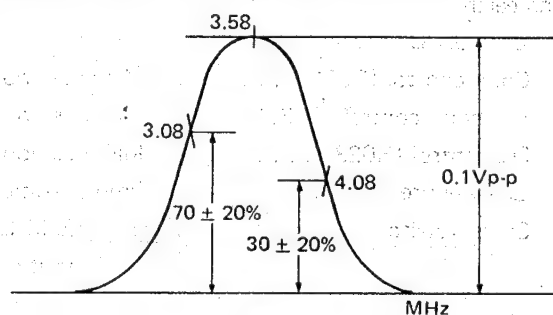


Fig. 20

AFC FINAL ALIGNMENT

Preparation Step

1. Set system switch to PAL position.
2. Connect output lead of 38.0 MHz CW to tuner point TP.
3. Connect VTVM to TPA5.
4. Set channel setting control to OFF position.
5. Connect short jumper BS terminal of tuner and earth.

Alignment Step

1. Adjust T901 to the reading $6.5 \pm 0.3V$.
2. Vary the frequency of CW oscillator in $\pm 100kHz$ and observe the voltage of VTVM as follows.
+100kHz Less than 4V
-100kHz More than 9V

SUB CONTRAST ALIGNMENT

Alignment Step

1. Receive a color bar signal.
2. Connect oscilloscope to TPB10.
3. Set controls as follows.
Contrast control Max. position
Color control Min. position

4. Adjust bright control (R342) and sub brightness control (R559) to obtain the waveform as in fig. 21.
5. Adjust sub contrast control (R316) to obtain the waveform as in fig. 21.

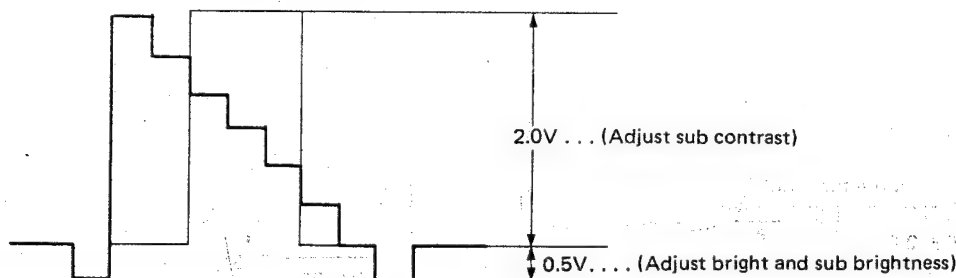


Fig. 21

APC ADJUSTMENT. (PAL)

1. Set controls as follows.

Color control Mid. position
 Sub color control Fully clockwise position
 Phase control Mid. position
 System switch. PAL position

2. Receive a Philips pattern.

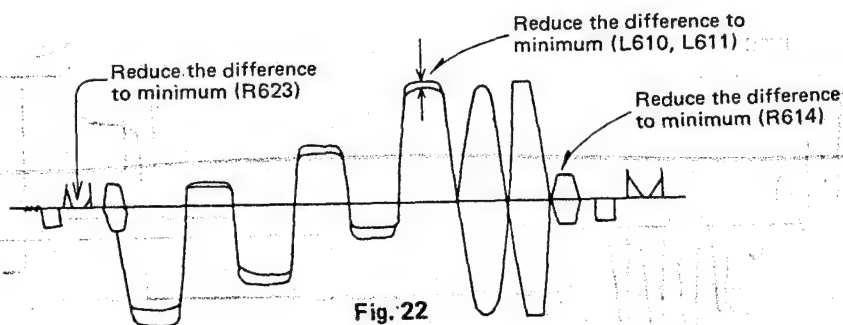
3. Connect capacitor jumper ($0.1\mu\text{F}$) between TPB2 and TPB5.
4. Connect resistor jumper ($100\text{k}\Omega$) between.
5. Connect oscilloscope to TPB9 (R-out).
6. Adjust APC control (R640) so that the waveform becomes vertical and it is standing or is moving.

COLOR DEMODULATOR AND DELAY LINE ALIGNMENT

Alignment Step

1. Receive color bar signal and set channel setting switch to ON position.
2. Connect capacitor jumper ($10\mu\text{F}/16\text{V}$) between TPB3 and earth.
3. Set controls as follows.
 Color control (R671) Max. position
 Sub color control (R635) Mid. position
 Contrast control (R340) Max. position
 System switch. PAL position

4. Connect oscilloscope to TPB11.
5. Adjust Phase control (R614) to obtain the waveform as in fig. 22.
6. If the results are unsatisfactory, repeat from APC alignment.
7. Adjust L610, L611 and R623 to obtain the waveform as in fig. 22.



COLOR KILLER ALIGNMENT

Set controls as follows.

System switch. PAL 5.5 MHz position
 Color control Max. position
 Bright control Max. position
 Contrast control Max. position.

Note: Antenna connection is not required.

2. Adjust killer control (R630) to the point where color noise just disappeared.

NTSC APC AND NTSC TINT ALIGNMENT

1. Set system switch to NTSC position.
2. Receive NTSC color bar signal and channel setting switch to ON position.
3. Connect short jumper between TPB2 and TPB5.
4. Connect resistor jumper (100k Ω) between TPB2 and TPB4.
5. Connect oscilloscope to TPB11.
6. Adjust APC control (C638) so that the waveform becomes vertical and it is standing or is moving.
7. Receive NTSC rainbow color bar signal.
8. Set the Tint control (R670) to clockwise and adjust Sub Tint control (R616) to obtain the waveform as in fig. 23.

SUB COLOR ALIGNMENT

1. Set system switch to NTSC position.
2. Receive rainbow color bar signal.
3. Connect capacitor jumper (10 μ F/16V) between TPB3 and earth.
4. Set color and contrast controls to maximum position.

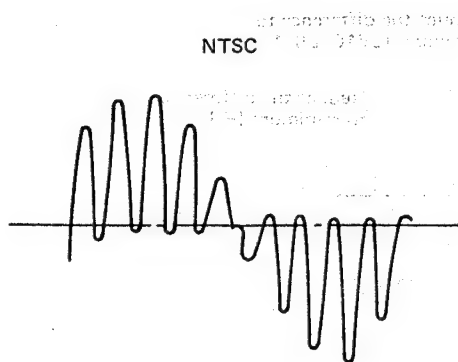


Fig. 24

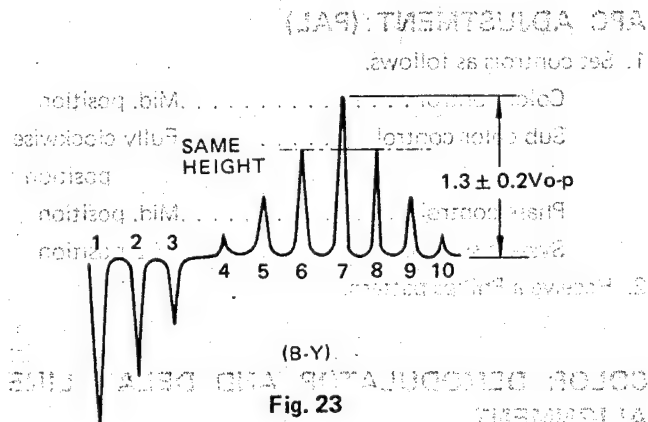


Fig. 23

5. Connect oscilloscope to TPB9 and adjust sub color control (R635) to obtain the waveform as in fig. 24.
6. Set system switch to PAL 5.5 MHz position.
7. Confirm that amplitude of R-Y waveform is more than 2.1Vo-p at TPB9.

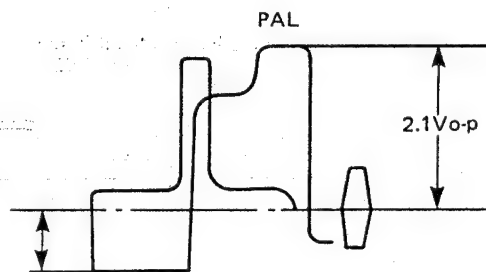


Fig. 25



A. M.NOS single-axis control preset electronic channel selection circuit.

1. The electronic channel selection circuit used in this chassis is an M.NOS single-axis control preset type, a kind of a voltage synthesizer channel selection circuit.
2. With the voltage synthesizer channel selection circuit, channel data (tuning voltage, band voltage, etc.) are converted into digital signals (represented by "1" and "0"), memorized in a semiconductor memory device, and fetched as required to receive the desired broadcast.

B. Signal flow

1. Channel data is treated as a 16-bit digital signal as described below.

- Tuning voltage (B_T voltage) 13 bits
- Band (V_L , V_H , UHF) 2 bits
- ON/OFF of local oscillation AFT 1 bit

16 bits

2. Twelve pieces of channel data are memorized in the address space (memory area) A-L of the M.NOS IC1202, MN1212A and fetched as required.

These addresses correspond respectively to the selection switches S1201 — S1212 (for example, address A corresponds to S1201.)

3. A microcomputer (IC1201, MN1411TX) functions to memorize (write)/fetch (read) channel data to and from MN1212A.

3. An M.NOS (metal-nitride-oxide semiconductor) memory, a non-volatile memory device (which can retain memory data for a certain period even when power supply ceases) is used as the semiconductor memory device in this system.

4. In channel presetting, the desired channel data selected by the microcomputer, via the band selection switch or tuning control, are converted into a 16-bits digital signal, and memorized in an M.NOS memory address selected with the selection switch.

5. During normal reception, channel data memorized in the M.NOS memory address corresponding to the selection switch position are read by the microcomputer.

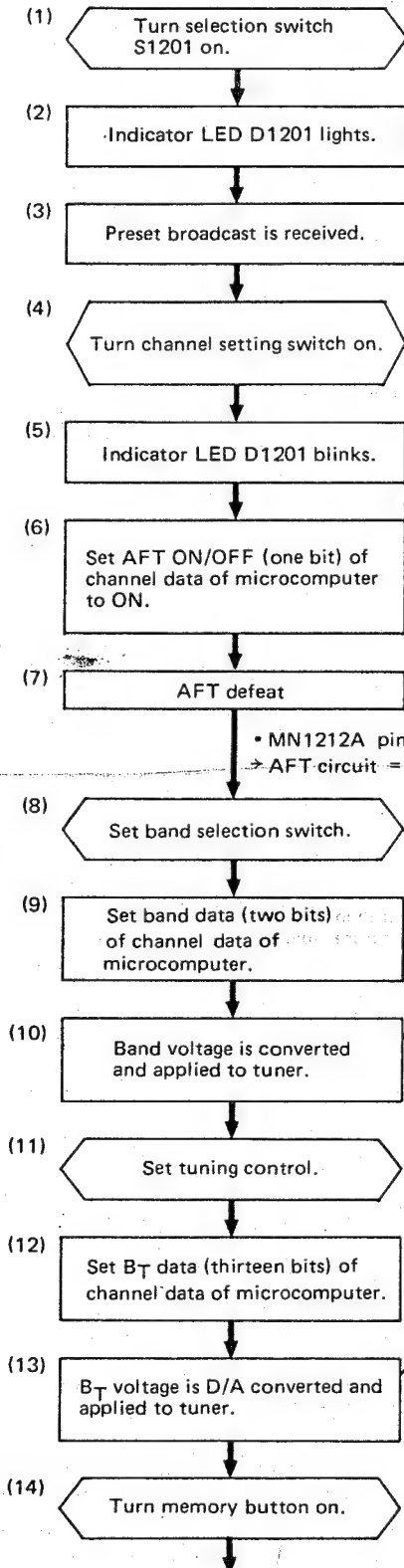
6. Channel data, a digital signal composed of "1" and "0", are converted by the channel selection control IC1203 (AN5031) and the conversion circuit of MN1212A into various voltages (B_T , B_V , B_U , B_S) which are required to drive the tuner.

C. Circuit functions

Major circuit functions are channel presetting and normal reception are explained below using the following flowchart.

(1) Functions at channel presetting

• Presetting position A



Signal Pin	Indicator output (MN1411TX)
⑩	
⑪	
⑫	
②	
③	
④	
⑤	
⑥	
⑦	

Table 1 Indicator output (when receiving broadcast preset at position A)

Signal Pin	Indicator output (MN1411TX)
⑩	

Table 2 Indicator output at channel presetting

Band selection switch position	Band data	MN1212A ④	AN5031		
			⑪ Bu	⑫ Bv	⑬ Bs
V _L	0 1	L (0V)	0 (0V)	1 (12V)	1 (24V)
V _H	1 0	M (5V)	0 (0V)	1 (12V)	0 (0V)
U	1 1	H (10V)	1 (12V)	0 (0V)	0 (0V)

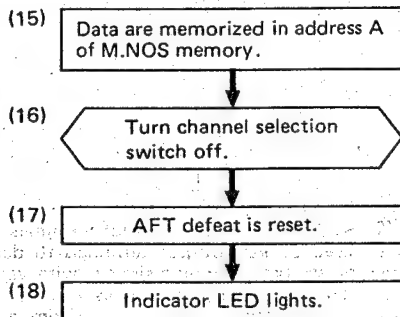
Table 3 Band selection output

Pin	Output
B _T data (13 bits)	
MN1411TX ⑩ AN5031 ⑪	
AN5031 ⑫	
AN5031 ⑬	

Table 4 B_T voltage output

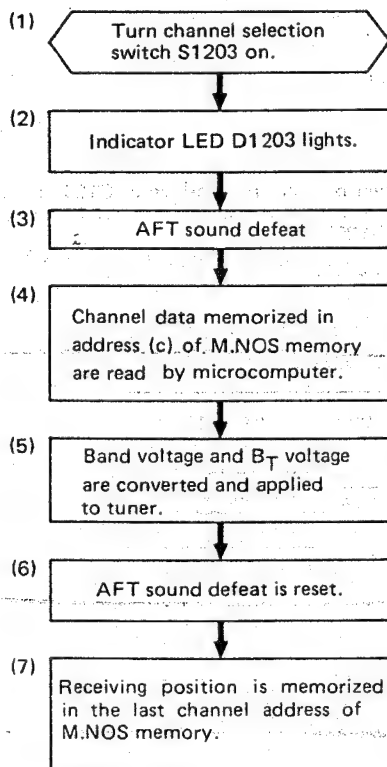
Pins ② ~ ⑦ are indicator output terminals, and are also used as key output terminals to deliver negative pulses (key scanning signals) with various phases. The key output terminals and the key input terminals (pins ⑩ ~ ⑫) from a key matrix, and the microcomputer detects states of various button switches by identifying which phase of the key scanning signal is inputted to which key input terminal.

• When pin ⑩ becomes zero, Q1203 is turned on, and +5V applied to the anodes of D1201 ~ D1205. When pin ② becomes zero, only D1201 is turned on.



(2) Functions at normal reception

• Selecting position C



- 16-bits data setted at steps (6), (9) and (13) are written in address A, which is selected by channel selection switch.
- Repeat the above steps to preset up to 12 channels.

- Defeat command at step (7) is reset, and AFT ON/OFF data of channel data of microcomputer are outputted. (ON/OFF data are set to ON at step (6).) MN1212A pin ③ = "0"
- Output at step (5) is returned to output at step (2).

- This step is the same as step (2) for presetting position A.

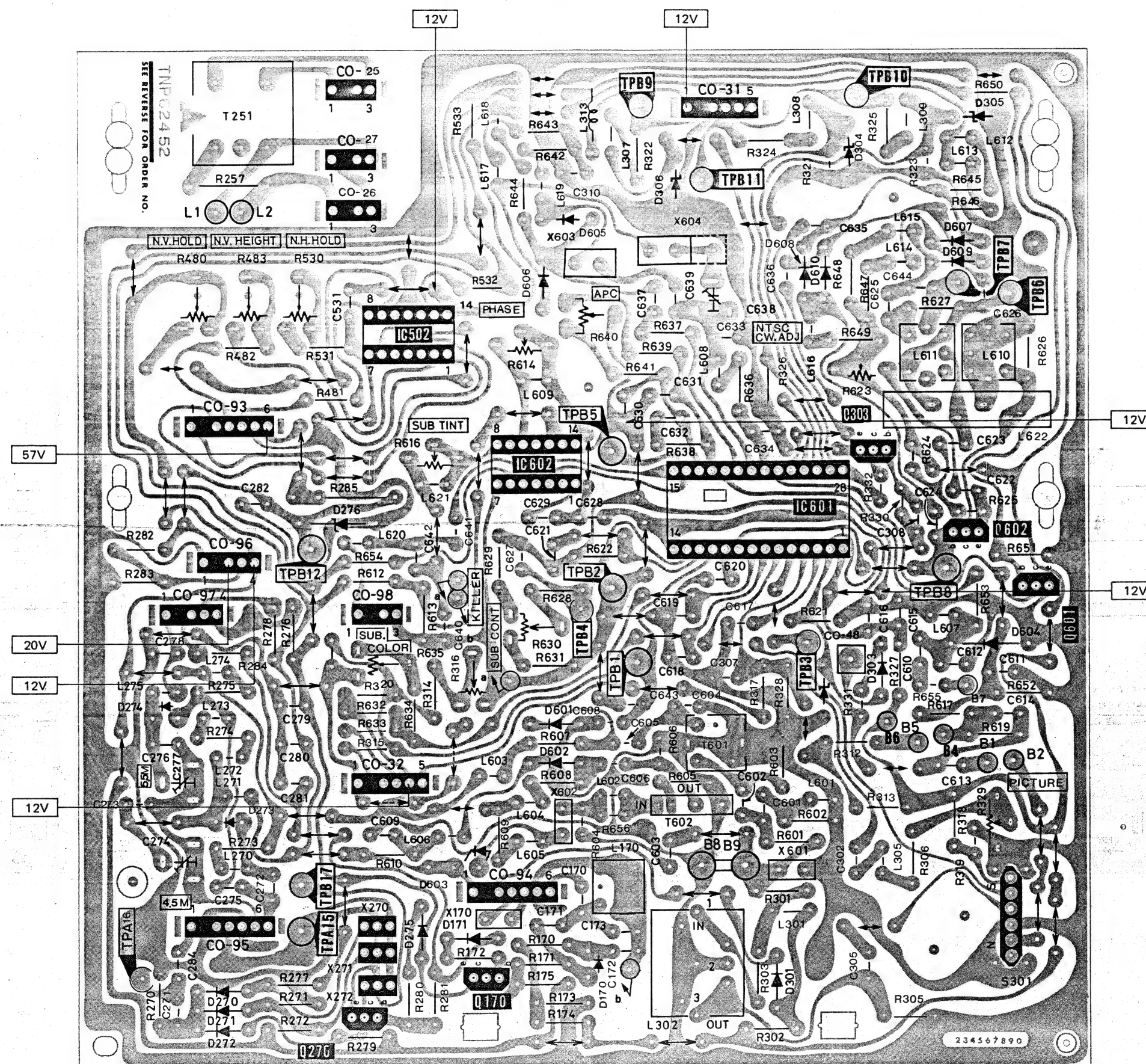
- AFT defeat is the same as step (6) for presetting position A. MN1212A pin ② = "1" → Q1208 → Sound defeat

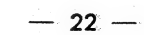
- This step is the same as steps (10) and (13).

- Accordingly, when main power is turned off once and then turned on again, the last position (which is immediately before power turn-off) is received. (Last channel operation)

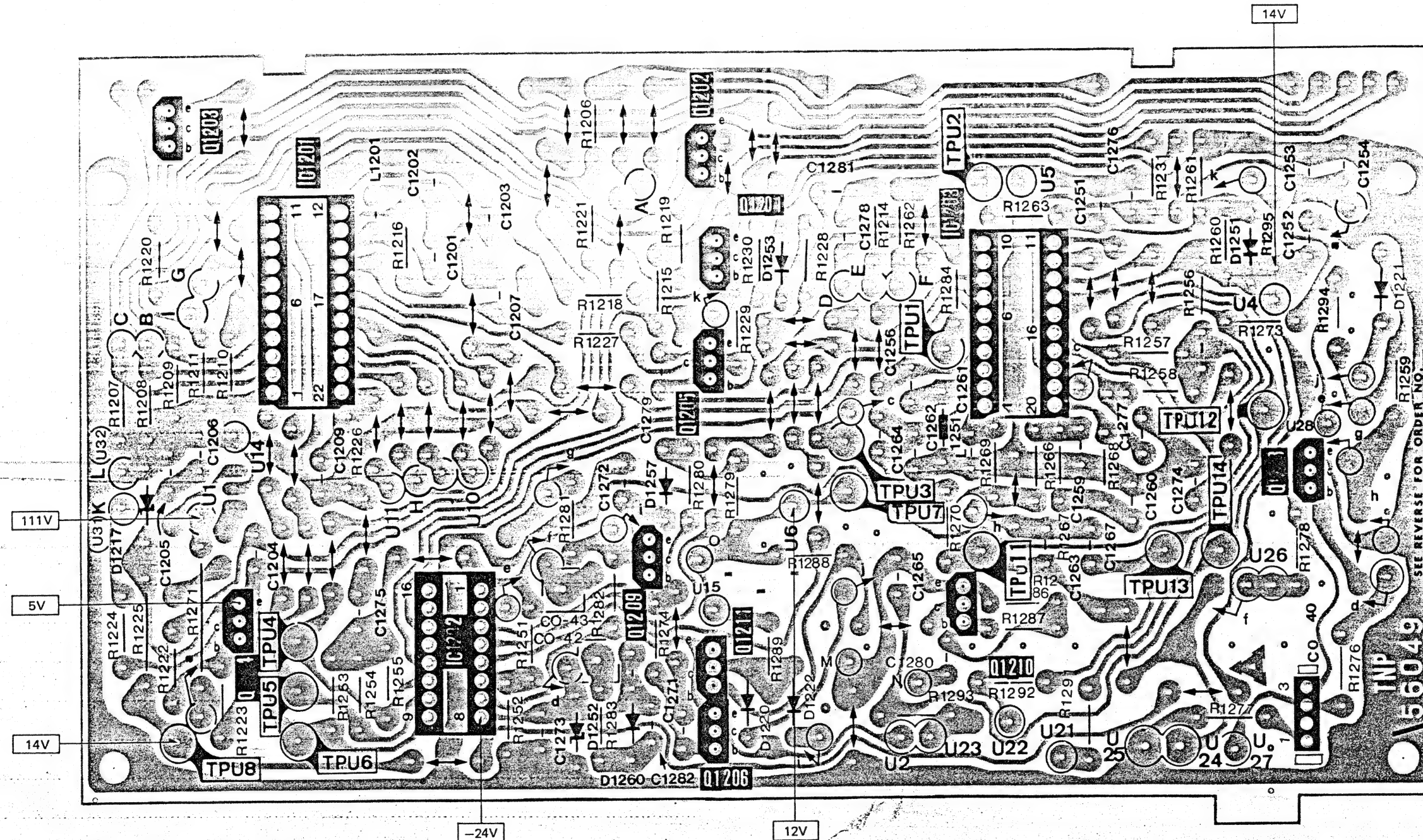
CONDUCTOR VIEWS

B-BOARD TNP62452ZA

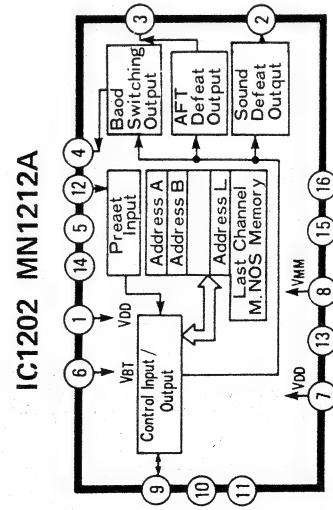
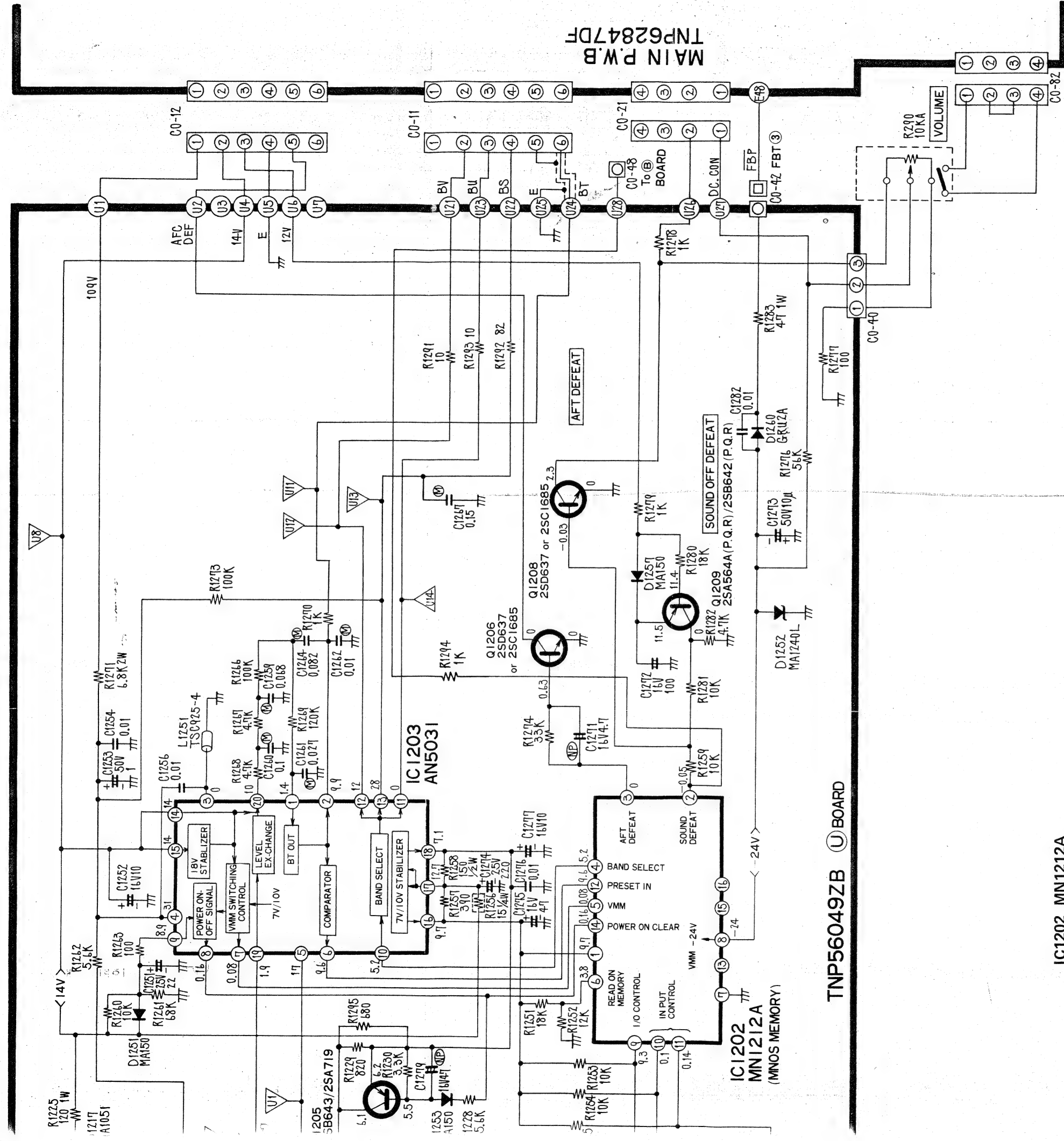




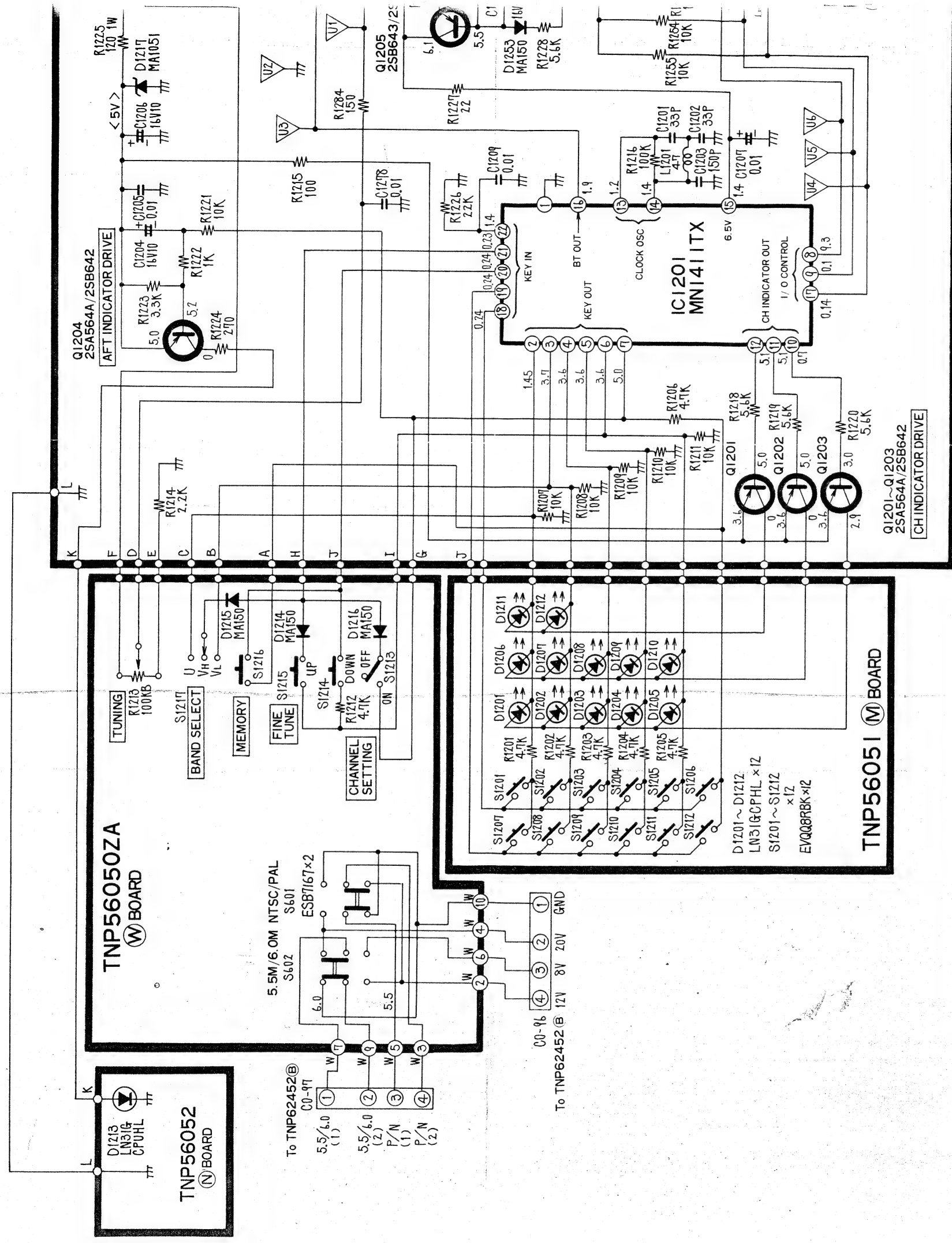
U-BOARD TNP56049ZB (TC-214NP)
TNP56049ZA (TC-214NPR)

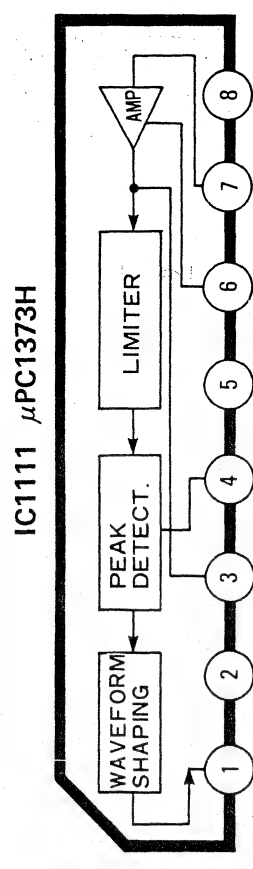
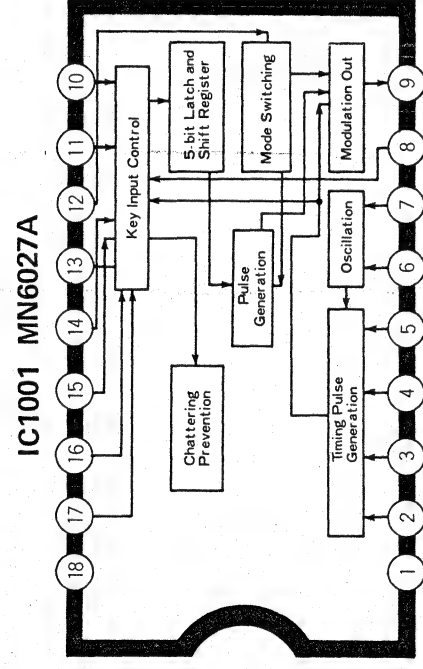
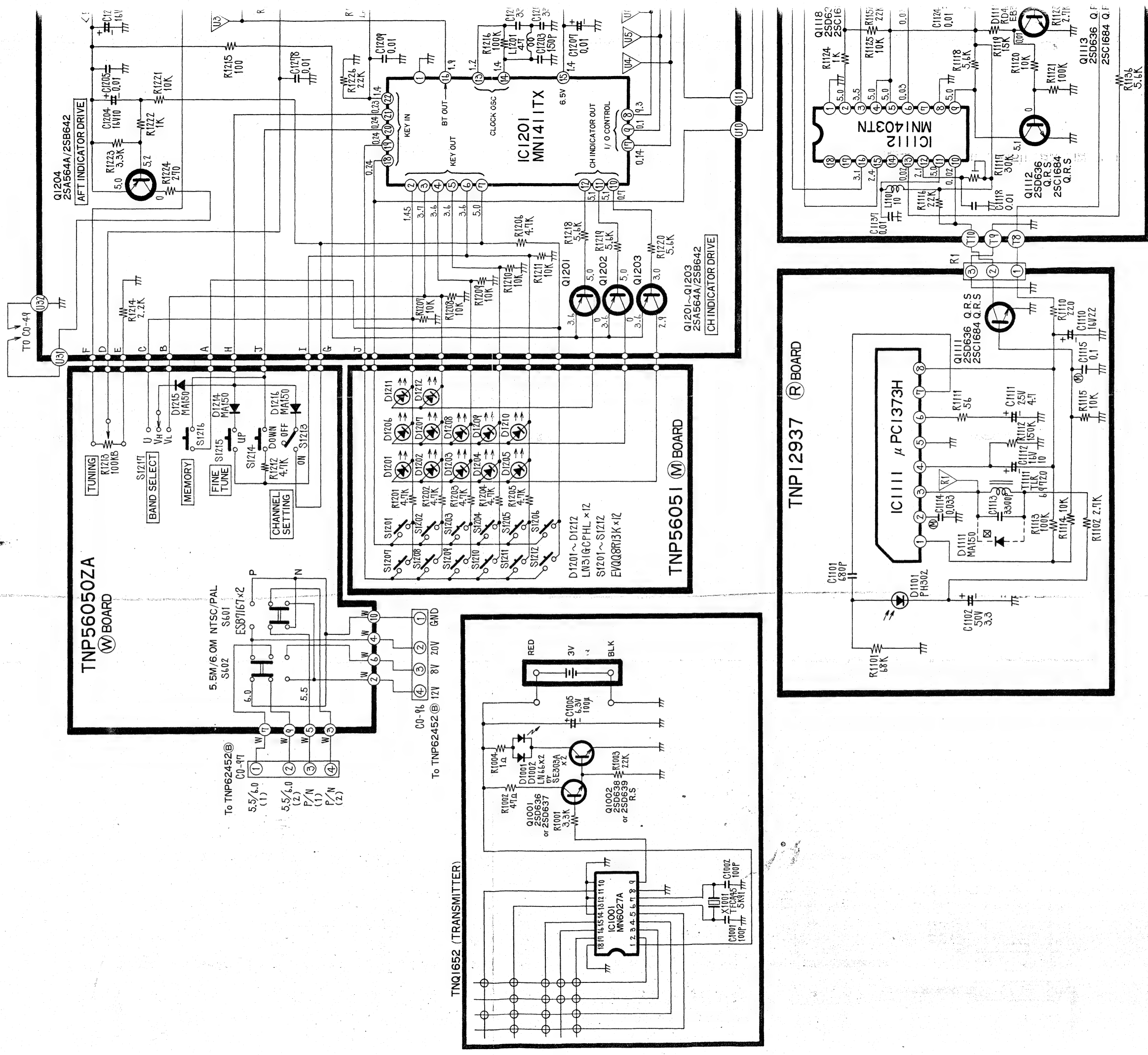


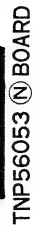
14NP (CHASSIS NO. RBX-M11E)



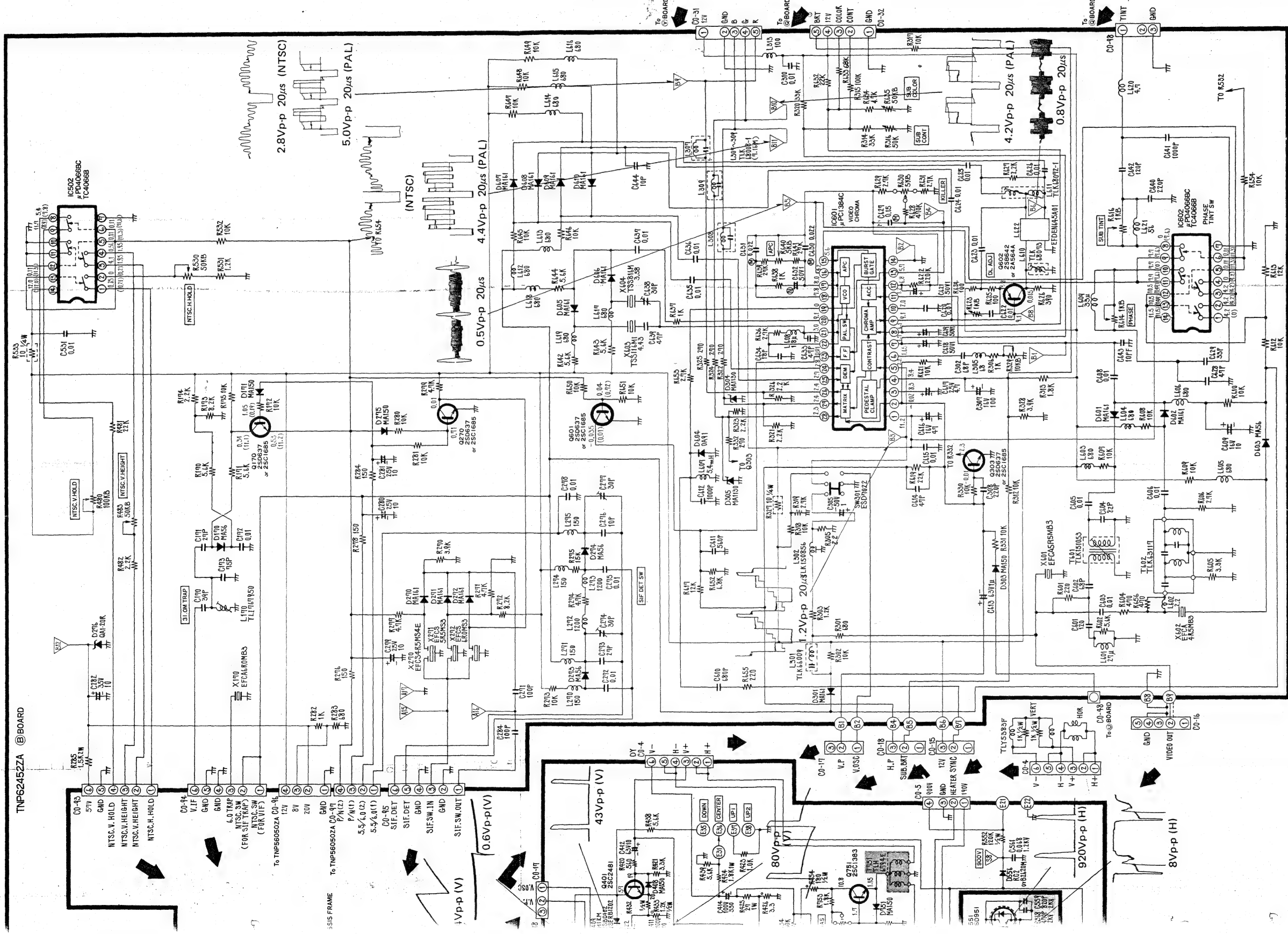
SCHEMATIC DIAGRAM FOR MODEL TC-2141







4NP/TC-214NPR (CHASSIS NO. RBX-M11E)



NOTE

1. RESISTOR
All resistors are carbon 1/4W resistor, unless otherwise noted the following marks.
Unit of resistance is OHM (Ω). (K=1,000, M=1,000,000)

● : Solid resistor
□ : Wire wound resistor
⊞ : Fuse resistor
⊞ : Fusible resistor

2. CAPACITOR
All capacitors are ceramic 50V capacitor, unless otherwise noted the following marks.
Unit of capacitance is μF, unless otherwise noted.

⊞ : Polyester capacitor
⊞ : Electrolytic capacitor

3. COIL
Unit of inductance is μH.

4. TEST POINT

1. Test point position

5. VOLTAGE MEASUREMENT

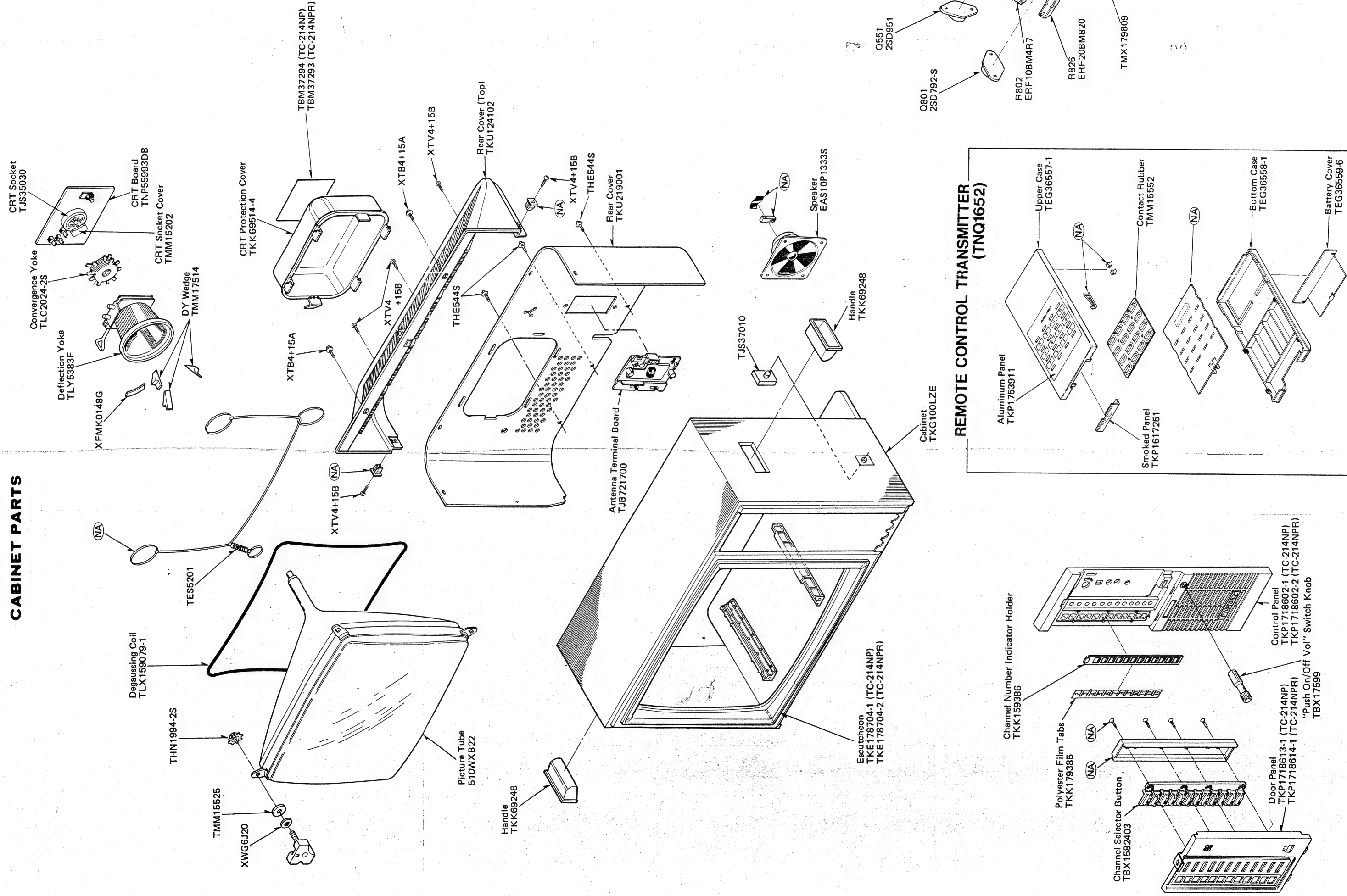
1. Voltage is measured by a volt ohm meter with DC 20K OHM/V receiving color bar signal, when all controls are set to the maximum position.
2. When arrow mark (→) is found, connection is easily found along with the direction of an arrow.
3. When schematic diagram of a board is described in more than two places, they are encircled with dotted line.....
4. This schematic diagram is the latest at the time of printing and subject to change without notice.

	25855 25856 25857 25858 25859 25860 25861 25862 25863 25864 25865 25866 25867 25868 25869 25870 25871 25872 25873 25874 25875 25876 25877 25878 25879 25880 25881 25882 25883 25884 25885 25886 25887 25888 25889 25890 25891 25892 25893 25894 25895 25896 25897 25898 25899 25900 25901 25902 25903 25904 25905 25906 25907 25908 25909 25910 25911 25912 25913 25914 25915 25916 25917 25918 25919 25920 25921 25922 25923 25924 25925 25926 25927 25928 25929 25930 25931 25932 25933 25934 25935 25936 25937 25938 25939 25940 25941 25942 25943 25944 25945 25946 25947 25948 25949 25950 25951 25952 25953 25954 25955 25956 25957 25958 25959 25960 25961 25962 25963 25964 25965 25966 25967 25968 25969 25970 25971 25972 25973 25974 25975 25976 25977 25978 25979 25980 25981 25982 25983 25984 25985 25986 25987 25988 25989 25990 25991 25992 25993 25994 25995 25996 25997 25998 25999 26000 26001 26002 26003 26004 26005 26006 26007 26008 26009 26010 26011 26012 26013 26014 26015 26016 26017 26018 26019 26020 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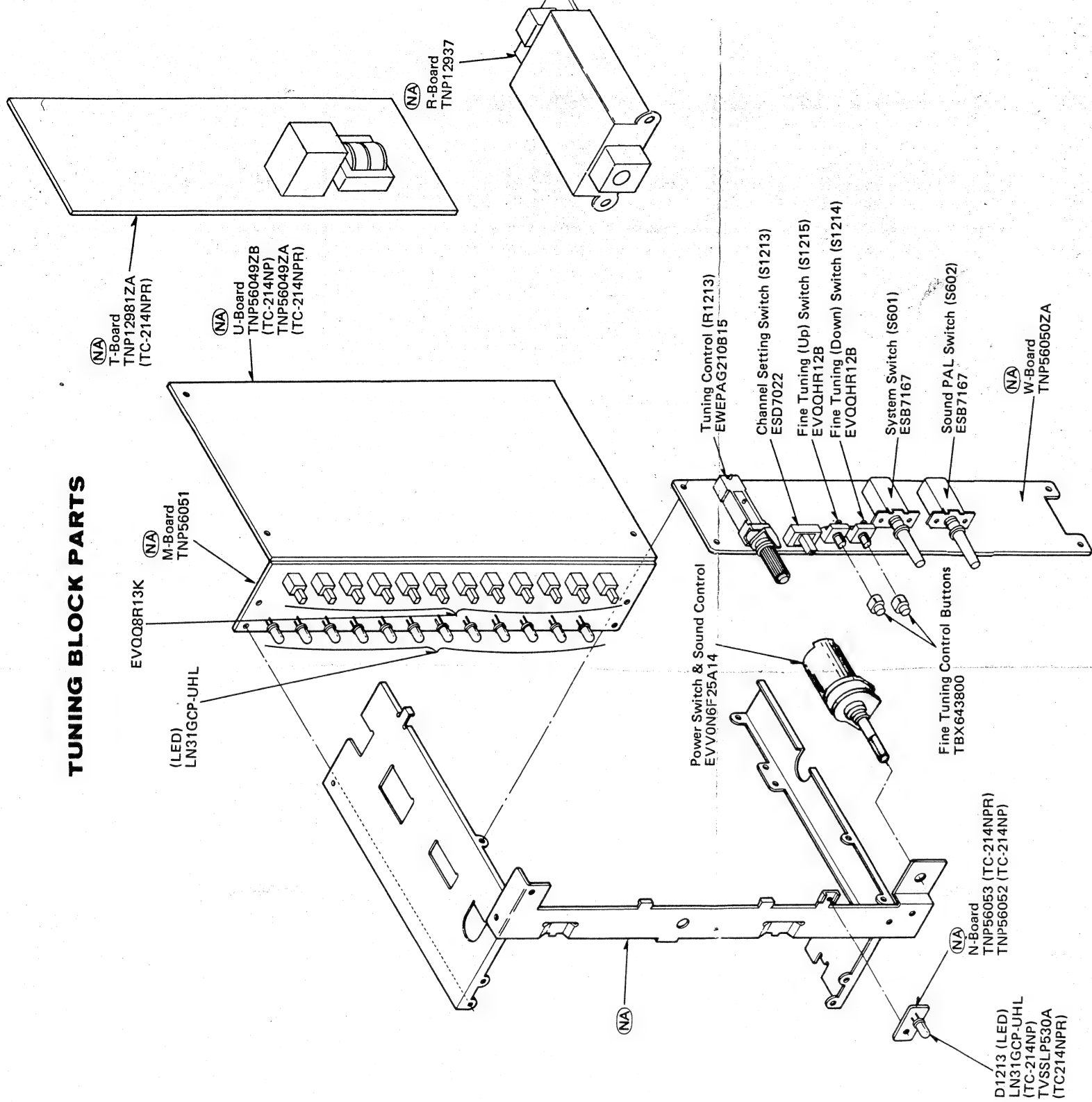
CABINET PARTS

CHASSI

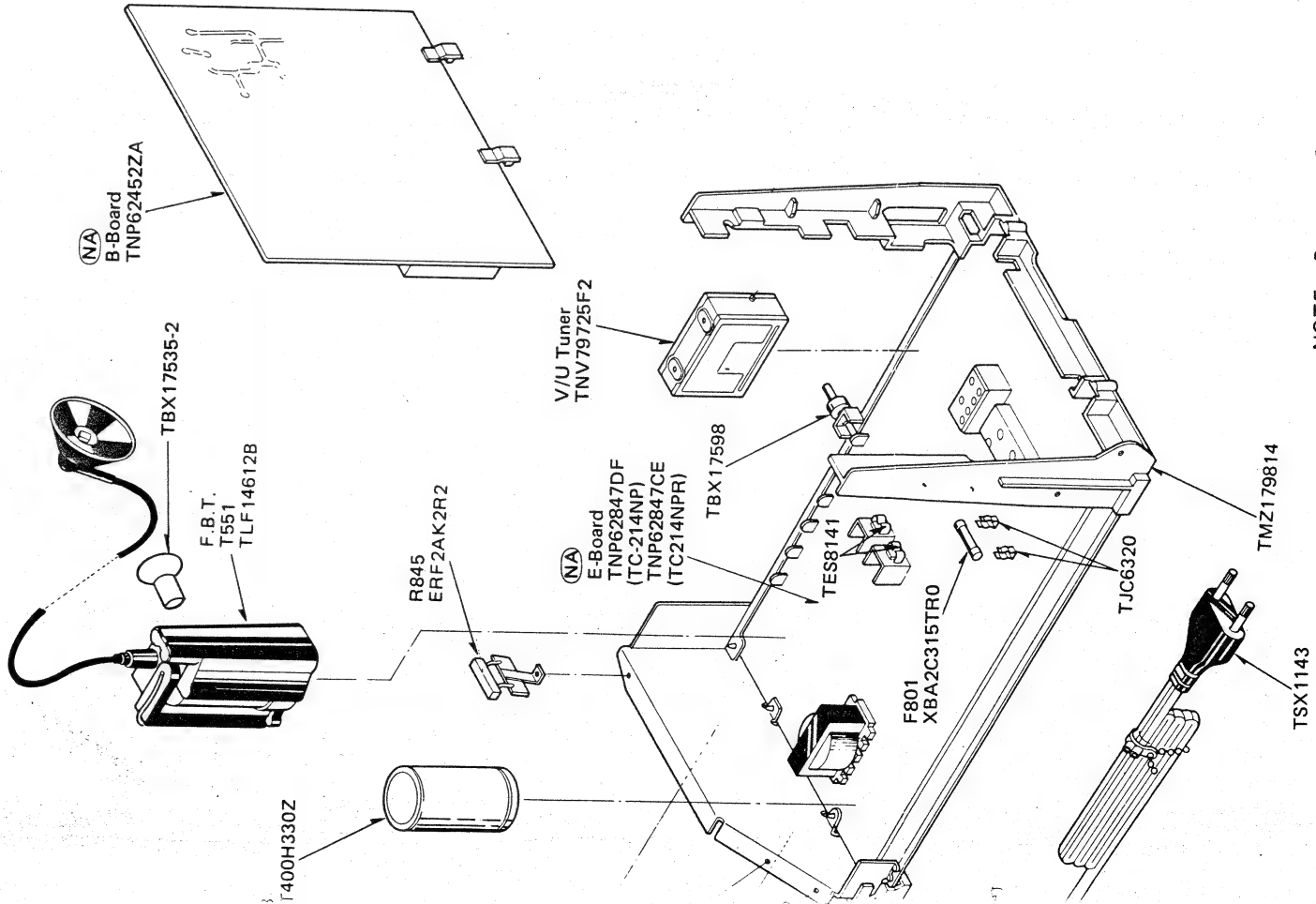
REMOTE CONTROL TRANSMITTER (TNQ1652)



TUNING BLOCK PARTS



CHASSIS PARTS



ABBREVIATION OF PART NAME AND DESCRIPTION

RESISTOR		
PART NAME & DESCRIPTION		ALLOWANCE
TYPE		
C	Carbon	F ± 1%
F	Fuse	J ± 5%
M	Metal Oxide	K ± 10%
S	Solid	M ± 20%
W	Wire Wound	G ± 2%

CAPACITOR		
PART NAME & DESCRIPTION		ALLOWANCE
TYPE		
C	Ceramic	C ± 0.25pF
E	Electrolytic	D ± 0.5pF
P	Polyester	F ± 1pF
S	Styrol	J ± 5%
T	Tantalum	K ± 10%
V	Trimmer	L ± 15%
		M ± 20%
		P +100%—0%
		Z +80%—20%

Part No. ERD12TJ104

Description 100K 1/2W

Example:

Part No. ECKD1H103PF2

Description 0.01uF 50V

Example:

NOTE: Parts or Components marked with (NA) and unlisted are not available as a replacement parts.

REPLACEMENT PARTS LIST

Important Safety Notice

Components identified by shaded area have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.

Note: TNP62847CE/DF, TNP62452ZA, TNP62458ZA, TNP56049ZB/ZA, TNP12981ZA, TNP12937, TNP56050ZA, TNP56052, TNP56053 and TNP56051 are not available as a complete printed circuit board.

TC-214NP/TC-214NPR COMMON PARTS

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
	RESISTORS				
R 51	ERD25TJ104	C 100KOHM, J, 1/4W	R 270	ERD25TJ392	C 3.9KOHM, J, 1/4W
R 64	ERD25FJ100	C 100HM, J, 1/4W	R 271	ERD25TJ472	C 4.7KOHM, J, 1/4W
R 66	ERD25TJ154	C 150KOHM, J, 1/4W	R 272	ERD25TJ822	C 8.2KOHM, J, 1/4W
R 106	ERD25TJ122	C 1.2KOHM, J, 1/4W	R 273	ERD25TJ103	C 10KOHM, J, 1/4W
R 107	ERD25TJ392	C 3.9KOHM, J, 1/4W	R 274	ERD25TJ472	C 4.7KOHM, J, 1/4W
			R 275	ERD25TJ153	C 15KOHM, J, 1/4W
R 108	ERD25TJ332	C 3.3KOHM, J, 1/4W	R 276	ERD25TJ151	C 150OHM, J, 1/4W
R 109	ERD25TJ272	C 2.7KOHM, J, 1/4W	R 277	ERD25TJ472	C 4.7KOHM, J, 1/4W
R 111	ERD25TJ822	C 8.2KOHM, J, 1/4W	R 278	ERD25TJ151	C 150OHM, J, 1/4W
R 115	ERD25TJ332	C 3.3KOHM, J, 1/4W	R 279	ERD25TJ472	C 4.7KOHM, J, 1/4W
R 117	ERD25TJ271	C 270OHM, J, 1/4W	R 280	ERD25TJ103	C 10KOHM, J, 1/4W
			R 281	ERD25TJ103	C 10KOHM, J, 1/4W
R 118	ERD25TJ222	C 2.2KOHM, J, 1/4W	R 282	ERD25TJ102	C 1KOHM, J, 1/4W
R 119	EVLSOMA00B53	CONTROL 5KOHMB	R 283	ERD25TJ681	C 680OHM, J, 1/4W
R 126	ERD25FJ100	C 100HM, J, 1/4W	R 284	ERD25TJ151	C 150OHM, J, 1/4W
R 130	ERD25TJ562	C 5.6KOHM, J, 1/4W			
R 131	ERD25TJ562	C 5.6KOHM, J, 1/4W	R 285	ERG2ANJ152H	M 1.5KOHM, J, 2W
			R 290	EVVON6F25A14	CONTROL 10KOHMA
R 132	ERD25TJ562	C 5.6KOHM, J, 1/4W	R 301	ERD25TJ681	C 680OHM, J, 1/4W
R 133	ERD25TJ562	C 5.6KOHM, J, 1/4W	R 302	ERD25TJ103	C 10KOHM, J, 1/4W
R 134	ERD25TJ820	C 820HM, J, 1/4W	R 303	ERD25TJ122	C 1.2KOHM, J, 1/4W
R 135	ERD25TJ562	C 5.6KOHM, J, 1/4W			
R 136	ERD25TJ562	C 5.6KOHM, J, 1/4W	R 305	ERD25TJ222	C 2.2KOHM, J, 1/4W
			R 306	ERD25TJ102	C 1KOHM, J, 1/4W
R 137	ERD25TJ222	C 2.2KOHM, J, 1/4W	R 312	ERD25TJ103	C 10KOHM, J, 1/4W
R 138	ERD25TJ822	C 8.2KOHM, J, 1/4W	R 313	ERD25TJ182	C 1.8KOHM, J, 1/4W
R 151	ERD25TJ183	C 18KOHM, J, 1/4W	R 314	ERD25TJ333	C 33KOHM, J, 1/4W
R 154	ERD25TJ683	C 68KOHM, J, 1/4W			
R 155	ERD25TJ823	C 82KOHM, J, 1/4W	R 315	ERD25TJ104	C 100KOHM, J, 1/4W
			R 316	EVNM4JA00B54	CONTROL 50KOHMB
R 156	ERD25TJ102	C 1KOHM, J, 1/4W	R 317	ERD25TJ103	C 10KOHM, J, 1/4W
R 170	ERD25TJ562	C 5.6KOHM, J, 1/4W	R 318	ERD25TJ103	C 10KOHM, J, 1/4W
R 171	ERD25TJ562	C 5.6KOHM, J, 1/4W	R 319	ERD25TJ272	C 2.7KOHM, J, 1/4W
R 172	ERD25TJ103	C 10KOHM, J, 1/4W			
R 173	ERD25TJ822	C 8.2KOHM, J, 1/4W	R 320	ERD25TJ333	C 33KOHM, J, 1/4W
			R 321	ERD25TJ222	C 2.2KOHM, J, 1/4W
R 174	ERD25TJ222	C 2.2KOHM, J, 1/4W	R 322	ERD25TJ271	C 270OHM, J, 1/4W
R 175	ERD25TJ103	C 10KOHM, J, 1/4W	R 323	ERD25TJ222	C 2.2KOHM, J, 1/4W
R 201	ERD25TJ222	C 2.2KOHM, J, 1/4W	R 324	ERD25TJ271	C 270OHM, J, 1/4W
R 202	ERG1ANJ560H	M 560HM, J, 1W			
R 203	ERD25TJ332	C 3.3KOHM, J, 1/4W	R 325	ERD25TJ271	C 270OHM, J, 1/4W
			R 326	ERD25TJ222	C 2.2KOHM, J, 1/4W
R 204	ERD25TJ102	C 1KOHM, J, 1/4W	R 327	ERQ14AJ100P	F 100HM, J, 1/4W
R 250	ERQ2CJP120S	F 120HM, J, 2W	R 328	ERD25TJ392	C 3.9KOHM, J, 1/4W
R 252	ERD25TJ101	C 100OHM, J, 1/4W	R 329	EVLSOMA00B14	CONTROL 10KOHMB
R 253	ERD25TJ4R7	C 4.7OHM, J, 1/4W			
R 254	ERD25TJ562	C 5.6KOHM, J, 1/4W	R 330	ERD25TJ103	C 10KOHM, J, 1/4W
			R 331	ERD25TJ103	C 10KOHM, J, 1/4W
R 257	ERG1ANJ270H	M 270HM, J, 1W	R 332	ERD25TJ271	C 270OHM, J, 1/4W
R 260	ERD25TJ103	C 10KOHM, J, 1/4W	R 340	EVHTAAF25B14	CONTROL 10KOHMB

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
R 342	EVHTAAF25B53	CONTROL 5KOHMB	R 426	ERD25FJ3R3	C 3.30HM, J, 1/4W
R 345	ERD25TJ332	C 3.3KOHM, J, 1/4W	R 427	ERD50FJ102	C 1KOHM, J, 1/2W
R 350	ERD25TJ683	C 68KOHM, J, 1/4W	R 428	ERD50FJ102	C 1KOHM, J, 1/2W
R 351	ERD25TJ121	C 1200HM, J, 1/4W	R 430	ERD25FJ100	C 100HM, J, 1/4W
R 352	ERD25TJ271	C 2700HM, J, 1/4W	R 431	ERD25FJ2R7	C 2.70HM, J, 1/4W
R 353	ERD25TJ121	C 1200HM, J, 1/4W	R 432	ERD50TJ5R6	C 5.60HM, J, 1/2W
R 354	EVLS3MA00B32	CONTROL 3000HMB	R 433	ERD50FJ122	C 1.2KOHM, J, 1/2W
R 355	EVLS3MA00B32	CONTROL 3000HMB	R 434	ERD25TJ184	C 180KOHM, J, 1/4W
R 356	ERD25TJ182	C 1.8KOHM, J, 1/4W	R 436	ERD25TJ123	C 12KOHM, J, 1/4W
R 357	ERD25TJ182	C 1.8KOHM, J, 1/4W	R 437	ERD25TJ684	C 680KOHM, J, 1/4W
R 358	ERD25TJ182	C 1.8KOHM, J, 1/4W	R 438	ERD25TJ562	C 5.6KOHM, J, 1/4W
R 359	EVLS3MA00B53	CONTROL 5KOHMB	R 439	ERD25TJ562	C 5.6KOHM, J, 1/4W
R 360	EVLS3MA00B53	CONTROL 5KOHMB	R 480	EVNM4JA00B15	CONTROL 100KOHMB
R 361	EVLS3MA00B53	CONTROL 5KOHMB	R 481	ERD25TJ223	C 22KOHM, J, 1/4W
R 362	ERG2ANJ123H	M 12KOHM, J, 2W	R 482	ERD25TJ222	C 2.2KOHM, J, 1/4W
R 363	ERG2ANJ123H	M 12KOHM, J, 2W	R 483	EVNM4JA00B54	CONTROL 50KOHMB
R 364	ERG2ANJ123H	M 12KOHM, J, 2W	R 501	ERD25TJ153	C 15KOHM, J, 1/4W
R 365	ERD50TJ272	C 2.7KOHM, J, 1/2W	R 502	ERD25TJ122	C 1.2KOHM, J, 1/4W
R 366	ERD50TJ272	C 2.7KOHM, J, 1/2W	R 503	ERD25TJ332	C 3.3KOHM, J, 1/4W
R 367	ERD50TJ272	C 2.7KOHM, J, 1/2W	R 504	ERD25TJ273	C 27KOHM, J, 1/4W
R 368	ERQ1CJ1R8	F 1.80HM, J, 1W	R 505	ER025CKF2551	M 2.55KOHM, F, 1/4W
R 370	ERC12GK824	S 820KOHM, K, 1/2W	R 506	EVLS0MA00B13	CONTROL 1KOHMB
R 371	EVT81US15B26	CONTROL 2MOHMB	R 507	ERD25TJ272	C 2.7KOHM, J, 1/4W
R 401	ERD25TJ471	C 4700HM, J, 1/4W	R 508	ER025CKF2002	M 20KOHM, F, 1/4W
R 402	ERD25TJ471	C 4700HM, J, 1/4W	R 509	ERD25TJ153	C 15KOHM, J, 1/4W
R 403	ERD25TJ393	C 39KOHM, J, 1/4W	R 510	ERG2ANJ103H	M 10KOHM, J, 2W
R 404	ERD25TJ684	C 680KOHM, J, 1/4W	R 511	ERD25TJ221	C 2200HM, J, 1/4W
R 405	ERD25TJ154	C 150KOHM, J, 1/4W	R 512	ERD25TJ471	C 4700HM, J, 1/4W
R 407	EVLS0MA00B14	CONTROL 10KOHMB	R 513	ERQ1CJP102S	F 1KOHM, J, 1W
R 408	ER025CKF8201	M 8.2KOHM, F, 1/4W	R 514	ERW12PKR15	W 0.150HM, K, 1/2W
R 409	EVLS0MA00B54	CONTROL 50KOHMB	R 516	ERG1ANJ392H	M 3.9KOHM, J, 1W
R 410	ER025CKF3902	M 39KOHM, F, 1/4W	R 517	EVLS0MA00B14	CONTROL 10KOHMB
R 412	ERD25TJ562	C 5.6KOHM, J, 1/4W	R 518	ER025CKF1873	M 187KOHM, F, 1/4W
R 413	ERD25TJ562	C 5.6KOHM, J, 1/4W	R 531	ERD25TJ122	C 1.2KOHM, J, 1/4W
R 414	ERD25TJ183	C 18KOHM, J, 1/4W	R 532	ERD25TJ103	C 10KOHM, J, 1/4W
R 415	ERD25TJ273	C 27KOHM, J, 1/4W	R 533	ERQ14AJ100P	F 100HM, J, 1/4W
R 416	ERD25TJ123	C 12KOHM, J, 1/4W	R 552	ERC12GK124	S 120KOHM, K, 1/2W
R 418	ERD25TJ681	C 6800HM, J, 1/4W	R 553	ERG1ANJ221H	M 2200HM, J, 1W
R 419	ERD25TJ104	C 100KOHM, J, 1/4W	R 554	ERQ12HJ101	F 1000HM, J, 1/2W
R 420	ERD25TJ561	C 5600HM, J, 1/4W	R 555	ERQ12HKR82	F 0.820HM, K, 1/2W
R 421	ERD25TJ332	C 3.3KOHM, J, 1/4W	R 556	ERD25FJ560	C 560HM, J, 1/4W
R 423	ERD25TJ102	C 1KOHM, J, 1/4W	R 557	ERQ12HKR82	F 0.820HM, K, 1/2W
R 424	ERG1ANJ182H	M 1.8KOHM, J, 1W	R 558	ERD25TJ223	C 22KOHM, J, 1/4W
R 425	ERG1ANJ270H	M 270HM, J, 1W	R 559	EVLS0MA00B15	CONTROL 100KOHMB

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
R 560	ER025CKF1503	M 150KOHM, F, 1/4W	R 647	ERD25TJ103	C 10KOHM, J, 1/4W
R 562	ERD25TJ273	C 27KOHM, J, 1/4W	R 648	ERD25TJ103	C 10KOHM, J, 1/4W
R 563	ERD50FJ220	C 220HM, J, 1/2W	R 649	ERD25TJ103	C 10KOHM, J, 1/4W
R 601	ERD25TJ221	C 220OHM, J, 1/4W	R 650	ERD25TJ103	C 10KOHM, J, 1/4W
R 602	ERD25TJ562	C 5.6KOHM, J, 1/4W	R 651	ERD25TJ103	C 10KOHM, J, 1/4W
R 604	ERD25TJ471	C 470OHM, J, 1/4W	R 652	ERD25TJ682	C 6.8KOHM, J, 1/4W
R 605	ERD25TJ332	C 3.3KOHM, J, 1/4W	R 653	ERD25TJ272	C 2.7KOHM, J, 1/4W
R 606	ERD25TJ272	C 2.7KOHM, J, 1/4W	R 654	ERD25TJ103	C 10KOHM, J, 1/4W
R 607	ERD25TJ103	C 10KOHM, J, 1/4W	R 655	ERD25TJ221	C 220OHM, J, 1/4W
R 608	ERD25TJ103	C 10KOHM, J, 1/4W	R 656	ERD25TJ471	C 470OHM, J, 1/4W
R 609	ERD25TJ103	C 10KOHM, J, 1/4W	R 670	EVHTAAF25A13	CONTROL 1KOHMA
R 610	ERD25TJ103	C 10KOHM, J, 1/4W	R 671	EVHTAAF25B14	CONTROL 10KOHMB
R 612	ERD25TJ103	C 10KOHM, J, 1/4W	R 672	ERD25TJ560	C 560HM, J, 1/4W
R 613	ERD25TJ123	C 12KOHM, J, 1/4W	R 751	ERD25TJ820	C 820HM, J, 1/4W
R 614	EVLS0MA00B13	CONTROL 1KOHMB	R 752	ERD25TJ102	C 1KOHM, J, 1/4W
R 616	EVLS0MA00B13	CONTROL 1KOHMB	R 753	ERD25TJ182	C 1.8KOHM, J, 1/4W
R 617	ERD25TJ123	C 12KOHM, J, 1/4W	R 754	ERD50FJ181	C 180OHM, J, 1/2W
R 619	ERD25TJ223	C 22KOHM, J, 1/4W	R 755	EVLS7MA00B12	CONTROL 100OHMB
R 621	ERD25TJ103	C 10KOHM, J, 1/4W	R 756	EVLS0MA00B13	CONTROL 1KOHMB
R 622	ERD25TJ224	C 220KOHM, J, 1/4W	R 757	EVLS0MA00B14	CONTROL 10KOHMB
R 623	EVLS0MA00B13	CONTROL 1KOHMB	R 801	ERC12ZGK335	S 3.3MOHM, K, 1/2W
R 624	ERD25TJ101	C 100OHM, J, 1/4W	R 802	ERF10BM4R7	W 4.7OHM, 10W
R 625	ERD25TJ101	C 100OHM, J, 1/4W	R 803	ERG2ANJ332H	M 3.3KOHM, J, 2W
R 626	ERD25TJ391	C 390OHM, J, 1/4W	R 804	ERG2ANJ683H	M 68KOHM, J, 2W
R 627	ERD25TJ222	C 2.2KOHM, J, 1/4W	R 805	ERG1ANJ123H	M 12KOHM, J, 1W
R 628	ERD25TJ474	C 470KOHM, J, 1/4W	R 806	ERD25TJ392	C 3.9KOHM, J, 1/4W
R 629	ERD25TJ272	C 2.7KOHM, J, 1/4W	R 807	ERD25TJ472	C 4.7KOHM, J, 1/4W
R 630	EVNM4JA00B53	CONTROL 5KOHMB	R 808	ERG2ANJ822H	M 8.2KOHM, J, 2W
R 631	ERD25TJ272	C 2.7KOHM, J, 1/4W	R 810	ER025CKF4321	M 4320OHM, F, 1/4W
R 632	ERD25TJ223	C 22KOHM, J, 1/4W	R 811	EVL3MA00B13	CONTROL 1KOHMB
R 633	ERD25TJ683	C 68KOHM, J, 1/4W	R 812	ERD25TJ472	C 4.7KOHM, J, 1/4W
R 634	ERD25TJ472	C 4.7KOHM, J, 1/4W	R 813	ERD25TJ223	C 22KOHM, J, 1/4W
R 635	EVNM4JA00B54	CONTROL 50KOHMB	R 814	ERD25TJ822	C 8.2KOHM, J, 1/4W
R 636	ERD25TJ272	C 2.7KOHM, J, 1/4W	R 815	ERD25TJ222	C 2.2KOHM, J, 1/4W
R 637	ERD25TJ102	C 1KOHM, J, 1/4W	R 816	ERQ3CJ5R6	F 5.6OHM, J, 3W
R 638	ERD25TJ102	C 1KOHM, J, 1/4W	R 818	ERG2ANJ562H	M 5.6KOHM, J, 2W
R 639	ERD25TJ273	C 27KOHM, J, 1/4W	R 819	ERG1ANJ103H	M 10KOHM, J, 1W
R 640	EVNM4JA00B53	CONTROL 5KOHMB	R 820	ERD50TJ100	C 100OHM, J, 1/2W
R 641	ERD25TJ273	C 27KOHM, J, 1/4W	R 822	ERD25TJ102	C 1KOHM, J, 1/4W
R 642	ERD25TJ562	C 5.6KOHM, J, 1/4W	R 824	ERG1ANJ683H	M 68KOHM, J, 1W
R 643	ERD25TJ562	C 5.6KOHM, J, 1/4W	R 825	ERF2AKR180	W 0.18OHM, K, 1/2W
R 644	ERD25TJ562	C 5.6KOHM, J, 1/4W	R 826	ERF20BM820	W 0.182OHM, K, 20W
R 645	ERD25TJ103	C 10KOHM, J, 1/4W	R 830	ERD25TJ472	C 4.7KOHM, J, 1/4W
R 646	ERD25TJ103	C 10KOHM, J, 1/4W	R 831	ERD25TJ332	C 3.3KOHM, J, 1/4W

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
R 832	ERD50TJ120	C 120OHM, J, 1/2W	R 1257	ERD25TJ391	C 3900OHM, J, 1/4W
R 834	ERG1ANJ221H	M 2200HM, J, 1W	R 1258	ERD50TJ151	C 1500HM, J, 1/2W
R 835	ERQ12HKR56	F 0.560HM, K, 1/2W	R 1259	ERD25TJ103	C 10KOHM, J, 1/4W
R 837	ERD25TJ222	C 2.2KOHM, J, 1/4W	R 1260	ERD25TJ103	C 10KOHM, J, 1/4W
R 838	ERG2ANJ823H	M 82KOHM, J, 2W	R 1261	ERD25TJ683	C 68KOHM, J, 1/4W
R 840	ERD25TJ221	C 2200HM, J, 1/4W	R 1262	ERD25TJ562	C 5.6KOHM, J, 1/4W
R 841	ER025CKF8252	M 82.5KOHM, F, 1/4W	R 1263	ERD25TJ101	C 1000HM, J, 1/4W
R 845	ERF2AK2R2	W 2.20HM, K, 2W	R 1266	ERD25TJ104	C 100KOHM, J, 1/4W
R 1001	ERD10TJ332	C 3.3KOHM, J, 1/8W	R 1267	ERD25TJ473	C 47KOHM, J, 1/4W
R 1002	ERD10TJ470	C 470HM, J, 1/8W	R 1268	ERD25TJ473	C 47KOHM, J, 1/4W
R 1003	ERD10TJ223	C 22KOHM, J, 1/8W	R 1269	ERD25TJ124	C 120KOHM, J, 1/4W
R 1004	ERD25TJ1R0	C 10HM, J, 1/4W	R 1270	ERD25TJ102	C 1KOHM, J, 1/4W
R 1201	ERD25TJ472	C 4.7KOHM, J, 1/4W	R 1271	ERG2ANJ682H	M 6.8KOHM, J, 2W
R 1202	ERD25TJ472	C 4.7KOHM, J, 1/4W	R 1273	ERD25TJ104	C 100KOHM, J, 1/4W
R 1203	ERD25TJ472	C 4.7KOHM, J, 1/4W	R 1274	ERD25TJ333	C 33KOHM, J, 1/4W
R 1204	ERD25TJ472	C 4.7KOHM, J, 1/4W	R 1276	ERD25TJ563	C 56KOHM, J, 1/4W
R 1205	ERD25TJ472	C 4.7KOHM, J, 1/4W	R 1277	ERD25TJ101	C 1000HM, J, 1/4W
R 1206	ERD25TJ472	C 4.7KOHM, J, 1/4W	R 1278	ERD25TJ102	C 1KOHM, J, 1/4W
R 1207	ERD25TJ103	C 10KOHM, J, 1/4W	R 1279	ERD25TJ102	C 1KOHM, J, 1/4W
R 1208	ERD25TJ103	C 10KOHM, J, 1/4W	R 1280	ERD25TJ183	C 18KOHM, J, 1/4W
R 1209	ERD25TJ103	C 10KOHM, J, 1/4W	R 1281	ERD25TJ103	C 10KOHM, J, 1/4W
R 1210	ERD25TJ103	C 10KOHM, J, 1/4W	R 1282	ERD25TJ472	C 4.7KOHM, J, 1/4W
R 1211	ERD25TJ103	C 10KOHM, J, 1/4W	R 1283	ERG1ANJ470	M 470HM, J, 1W
R 1212	ERD25TJ472	C 4.7KOHM, J, 1/4W	R 1284	ERD25TJ151	C 1500HM, J, 1/4W
R 1213	EWEPAG210B15	CONTROL 100KOHMB	R 1291	ERD25TJ100	C 100HM, J, 1/4W
R 1214	ERD25TJ222	C 2.2KOHM, J, 1/4W	R 1292	ERD25TJ820	C 820HM, J, 1/4W
R 1215	ERD25TJ101	C 1000HM, J, 1/4W	R 1293	ERD25TJ100	C 100HM, J, 1/4W
R 1216	ERD25TJ104	C 100KOHM, J, 1/4W	R 1294	ERD25TJ102	C 1KOHM, J, 1/4W
R 1218	ERD25TJ562	C 5.6KOHM, J, 1/4W	R 1295	ERD25TJ681	C 6800HM, J, 1/4W
R 1219	ERD25TJ562	C 5.6KOHM, J, 1/4W	CAPACITORS		
R 1220	ERD25TJ562	C 5.6KOHM, J, 1/4W	C 51	ECEA50ZR47	E 0.47UF, 50V
R 1221	ERD25TJ103	C 10KOHM, J, 1/4W	C 53	ECEA16Z10	E 10UF, 16V
R 1222	ERD25TJ102	C 1KOHM, J, 1/4W	C 54	ECSZ16EF10Y	T 10UF, 16V
R 1223	ERD25TJ332	C 3.3KOHM, J, 1/4W	C 55	ECEA1CS100	E 10UF, 16V
R 1224	ERD25TJ271	C 2700HM, J, 1/4W	C 56	ECKF1H103ZF	C 0.01UF, Z, 50V
R 1225	ERG1ANJ121H	M 1200HM, J, 1W	C 57	ECEA50ZR47	E 0.47UF, 50V
R 1226	ERD25TJ223	C 22KOHM, J, 1/4W	C 106	ECKF1H102KB	C 1000PF, K, 50V
R 1227	ERD25TJ220	C 220HM, J, 1/4W	C 108	ECKF1H103ZF	C 0.01UF, Z, 50V
R 1228	ERD25TJ562	C 5.6KOHM, J, 1/4W	C 109	ECEA50Z1R5	E 1.5UF, 50V
R 1229	ERD25TJ821	C 8200HM, J, 1/4W	C 110	ECKF1H102KB	C 1000PF, K, 50V
R 1230	ERD25TJ332	C 3.3KOHM, J, 1/4W	C 113	ECEA1HS010	E 0.01UF, 50V
R 1231	ERD25TJ220	C 220HM, J, 1/4W	C 116	ECEA1CS471	E 470UF, 16V
R 1251	ERD25TJ183	C 18KOHM, J, 1/4W	C 117	ECKF1H103ZF	C 0.01UF, Z, 50V
R 1252	ERD25TJ123	C 12KOHM, J, 1/4W			
R 1253	ERD25TJ103	C 10KOHM, J, 1/4W			
R 1254	ERD25TJ103	C 10KOHM, J, 1/4W			
R 1255	ERD25TJ103	C 10KOHM, J, 1/4W			
R 1256	ERQ14AJ150P	F 150HM, J, 1/4W			

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
C 120	ECEA1CS101	E 100UF, 16V	C 278	ECKF1H103ZF	C 0.01UF, Z, 50V
C 131	ECCF1H270JP	C 27PF, J, 50V	C 279	ECEA1ES100	E 10UF, 25V
C 132	ECCF1H150J	C 15PF, J, 50V	C 280	ECEA1ES100	E 10UF, 25V
C 133	ECKF1H103ZF	C 0.01UF, Z, 50V	C 281	ECEA1ES100	E 10UF, 25V
C 134	ECCF1H120JC	C 12PF, J, 50V	C 282	ECEA1VS100	E 10UF, 35V
C 135	ECCF1H220JP	C 22PF, J, 50V	C 284	ECCF1H101J	C 100PF, J, 50V
C 136	ECKF1H103ZF	C 0.01UF, Z, 50V	C 302	ECCF1H680J	C 68PF, J, 50V
C 137	ECCF1H080CC	C 8PF, C, 50V	C 305	ECEA1HN010S	E 1UF, 50V
C 138	ECCF1H080CC	C 8PF, C, 50V	C 307	ECEA1CS101	E 100UF, 16V
C 140	ECCF1H050C	C 5PF, C, 50V	C 308	ECCF1H221J	C 220PF, J, 50V
C 141	ECKF1H103ZF	C 0.01UF, Z, 50V	C 310	ECKF1H103ZF	C 0.01UF, Z, 50V
C 151	ECCF1H070CC	C 7PF, C, 50V	C 351	ECKF1H561KB	C 560PF, K, 50V
C 152	ECKF1H103ZF	C 0.01UF, Z, 50V	C 352	ECKF1H561KB	C 560PF, K, 50V
C 154	ECSF35ER47Y	T 0.47UF, 35V	C 353	ECKF1H681KB	C 680PF, K, 50V
C 155	ECCF1H101J	C 100PF, J, 50V	C 355	ECKD3D821KB9	C 820PF, K, 2KV
C 156	ECKF1H103ZF	C 0.01UF, Z, 50V	C 401	ECEA1CS100	E 10UF, 16V
C 157	ECCF1H270J	C 27PF, J, 50V	C 402	ECEA1HS2R2	E 2.2UF, 50V
C 170	ECCF1H390JC	C 39PF, J, 50V	C 403	ECKF1H471KB	C 470PF, K, 50V
C 171	ECCF1H270JP	C 27PF, J, 50V	C 404	ECSZ16EF3R3V	T 3.3UF, 16V
C 172	ECKF1H103ZF	C 0.01UF, Z, 50V	C 405	ECSZ16EF3R3V	T 3.3UF, 16V
C 173	ECCF1H750JP	C 75PF, J, 50V	C 406	ECEA1CN101S	E 100UF, 16V
C 203	ECQM1H103KZ	P 0.01UF, K, 50V	C 407	ECQM2102KZ	P 1000PF, K, 200V
C 204	ECQM1H683KZ	P 0.068UF, K, 50V	C 408	ECEA1HS010	E 1UF, 50V
C 205	ECEA1HN010S	E 1UF, 50V	C 409	ECSZ16EF10N	T 10UF, 16V
C 206	ECCF1H120J	C 12PF, J, 50V	C 411	ECEA2AS100	E 10UF, 100V
C 208	ECEA1CS331	E 330UF, 16V	C 412	ECEA1JS100	E 10UF, 63V
C 209	ECKF1H103ZF	C 0.01UF, Z, 50V	C 413	ECEA2AS220	E 22UF, 100V
C 210	ECQM1H223KZ	P 0.022UF, K, 50V	C 414	ECEA2AS331	E 330UF, 100V
C 211	ECEA1CS330	E 33UF, 16V	C 415	ECQM1H183KZ	P 0.018UF, K, 50V
C 230	ECCF1H470JC	C 47PF, J, 50V	C 417	ECQM1H273KZ	P 0.027UF, K, 50V
C 251	ECEA1ES471	E 470UF, 25V	C 418	ECQM1H393KZ	P 0.039UF, K, 50V
C 252	ECEA1CS330	E 33UF, 16V	C 421	ECEA1CS100	E 10UF, 16V
C 253	ECEA1CS471	E 470UF, 16V	C 501	ECKF1H561KB	C 560PF, K, 50V
C 254	ECQM1H473KZ	P 0.047UF, K, 50V	C 502	ECCF1H181J	C 180PF, J, 50V
C 255	ECEA1HS3R3	E 3.3UF, 50V	C 503	ECQM1H562KZ	P 5600PF, K, 50V
C 260	ECQM1H223KZ	P 0.022UF, K, 50V	C 504	ECQM1H104KZ	P 0.1UF, K, 50V
C 261	ECEA1HS010	E 1UF, 50V	C 505	ECQM1H392JZ	P 3900PF, J, 50V
C 271	ECCF1H101J	C 100PF, J, 50V	C 506	ECEA1ES4R7	E 4.7UF, 25V
C 272	ECKF1H103ZF	C 0.01UF, Z, 50V	C 507	ECQM1H392JZ	P 3900PF, J, 50V
C 273	ECCF1H270JC	C 27PF, J, 50V	C 508	ECQP1392GZ	P 3900PF, G, 1KV
C 274	ECV1ZW30X32	TRIMMER	C 509	ECEA1CS100	E 10UF, 16V
C 275	ECKF1H103ZF	C 0.01UF, Z, 50V	C 510	ECEA1ES470	E 47UF, 25V
C 276	ECCF1H100DC	C 10PF, D, 50V	C 513	ECKD2H152KB	C 1500PF, K, 500V
C 277	ECV1ZW30X32	TRIMMER	C 531	ECKF1H103ZF	C 0.01UF, Z, 50V

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
C 551	ECEA2CS4R7	E 4.7UF, 160V	C 631	ECQM1H223KZ	P 0.022UF, K, 50V
C 552	ECQE4474JCA	P 0.47UF, J, 400V	C 632	ECEA1HN010S	E 1UF, 50V
C 553	ECEA2CSR47	E 0.47UF, 160V	C 633	ECCF1H470JC	C 47PF, J, 50V
C 554	ECEA1ES102	E 1000UF, 25V	C 634	ECCF1H180JC	C 18PF, J, 50V
C 555	ECEA2ES100	E 10UF, 250V	C 635	ECKF1H103ZF	C 0.01UF, Z, 50V
C 556	ECKD3D182JB8	C 1800PF, J, 2KV	C 636	ECKF1H103ZF	C 0.01UF, Z, 50V
C 557	ECKD3D182JB8	C 1800PF, J, 2KV	C 637	ECKF1H103ZF	C 0.01UF, Z, 50V
C 558	ECKD3D182JB8	C 1800PF, J, 2KV	C 638	ECV1ZW30X32	TRIMMER
C 559	ECKD3D821JBN	C 820PF, J, 2KV	C 639	ECCF1H470JC	C 47PF, J, 50V
C 560	ECKD3D471KB9	C 470PF, K, 2KV	C 640	ECCF1H221J	C 220PF, J, 50V
C 561	ECQE12683KZ	P 0.068UF, K, 1.2KV	C 641	ECKF1H102KB	C 1000PF, K, 50V
C 565	ECKD3D182JB8	C 1800PF, J, 2KV	C 642	ECCF1H121JC	C 120PF, J, 50V
C 566	ECEA1CS470	E 47UF, 16V	C 643	ECCF1H100D	C 10PF, D, 50V
C 567	ECSF16E3R3Y	T 3.3UF, 16V	C 644	ECCF1H100D	C 10PF, D, 50V
C 568	ECKD3D471KBN	C 470PF, K, 2KV	C 751	ECEA1CN330S	E 33UF, 16V
C 601	ECCF1H121JP	C 120PF, J, 50V	C 752	ECEA0JS331	E 330UF, 6.3V
C 602	ECCF1H680J	C 68PF, J, 50V	C 801	ECQE10473KZ	P 0.047UF, K, 1KV
C 603	ECKF1H103ZF	C 0.01UF, Z, 50V	C 802	ECQE10473KZ	P 0.047UF, K, 1KV
C 604	ECCF1H820JP	C 82PF, J, 50V	C 803	ECET400H330Z	E 330UF, 400V
C 605	ECKF1H103ZF	C 0.01UF, Z, 50V	C 804	ECQM1H562KZ	P 5600PF, K, 50V
C 606	ECKF1H103ZF	C 0.01UF, Z, 50V	C 806	ECEA1CS330	E 33UF, 16V
C 608	ECKF1H103ZF	C 0.01UF, Z, 50V	C 807	ECKF1H102KB	C 1000PF, K, 50V
C 609	ECEA1CS100	E 10UF, 16V	C 808	ECEA1CS221	E 220UF, 16V
C 610	ECKF1H681KB	C 680PF, K, 50V	C 810	ECKD2H152KB	C 1500PF, K, 500V
C 611	ECKF1H561KB	C 560PF, K, 50V	C 811	ECQM2333KZ	P 0.033UF, K, 200V
C 612	ECKF1H102KB	C 1000PF, K, 50V	C 815	ECKD2H103PE	C 0.01UF, P, 500V
C 613	ECEA1JS010	E 1UF, 63V	C 816	ECKD2H471KB	C 470PF, K, 500V
C 614	ECCF1H470J	C 47PF, J, 50V	C 817	ECKD2H472PE	C 4700PF, P, 500V
C 615	ECKF1H103ZF	C 0.01UF, Z, 50V	C 818	ECKD2H472PE	C 4700PF, P, 500V
C 616	ECEA1CS470	E 47UF, 16V	C 819	ECKD2H472PE	C 4700PF, P, 500V
C 617	ECEA1ES4R7	E 4.7UF, 25V	C 820	ECEA1HS2R2	E 2.2UF, 50V
C 618	ECEA1HS010	E 1UF, 50V	C 822	ECCF1H471J	C 470PF, J, 50V
C 619	ECEA1HS010	E 1UF, 50V	C 823	ECKF1H102KB	C 1000PF, K, 50V
C 620	ECKF1H103ZF	C 0.01UF, Z, 50V	C 825	ECKD2H102KB2	C 1000PF, K, 500V
C 621	ECEA1HS010	E 1UF, 50V	C 831	ECET2CR471SW	E 470UF, 50V
C 622	ECKF1H103ZF	C 0.01UF, Z, 50V	C 832	ECKD2H103PE	C 0.01UF, P, 500V
C 623	ECKF1H103ZF	C 0.01UF, Z, 50V	C 833	ECEA1JS471	E 470UF, 63V
C 624	ECKF1H103ZF	C 0.01UF, Z, 50V	C 834	ECKD2H103PE	C 0.01UF, P, 500V
C 625	ECKF1H103ZF	C 0.01UF, Z, 50V	C 835	ECEA1ES331	E 330UF, 25V
C 626	ECKF1H103ZF	C 0.01UF, Z, 50V	C 838	ECKD2H471KB	C 470PF, K, 500V
C 627	ECQM1H154KZ	P 0.15UF, K, 50V	C 839	ECKD2H472PE	C 4700PF, P, 500V
C 628	ECCF1H470JC	C 47PF, J, 50V	C 843	ECKD2H471KB	C 470PF, K, 500V
C 629	ECCF1H330JC	C 33PF, J, 50V	C 844	ECKD2H471KB	C 470PF, K, 500V
C 630	ECQM1H223KZ	P 0.022UF, K, 50V	C 1001	ECKF1H101KB	C 100PF, K, 50V
			C 1002	ECKF1H101KB	C 100PF, K, 50V
			C 1005	ECEA1CS101	E 100UF, 6.3V
			C 1201	ECCF1H330JC	C 33PF, J, 50V

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
C 1202	ECCF1H330JP	C 33PF, J, 50V	L 273	TLT122K999G	PEAKING COIL 220U
C 1203	ECCF1H151JC	C 150PF, J, 50V	L 274	TLT151K991K	PEAKING COIL 150U
C 1204	ECEA1CS100	E 10UF, 16V	L 275	TLT151K991K	PEAKING COIL 150U
C 1205	ECKF1H103ZF	C 0.01UF, Z, 50V	L 301	TLK66009	CHROMA TRANS.
C 1206	ECEA1CS100	E 10UF, 16V	L 302	TLK150856	DELAY LINE, VIDEO
C 1207	ECKF1H103ZF	C 0.01UF, Z, 50V	L 305	TLT680K991K	PEAKING COIL 68U
C 1209	ECKF1H103ZF	C 0.01UF, Z, 50V	L 307	TLK68008	TRAP
C 1251	ECEA1ES220	E 22UF, 25V	L 308	TLK68008	TRAP
C 1252	ECEA1CS100	E 10UF, 16V	L 309	TLK68008	TRAP
C 1253	ECEA1HS010	E 1UF, 50V	L 313	TLQ101K126C	PEAKING COIL 100U
C 1254	ECKF1H103ZF	C 0.01UF, Z, 50V	L 351	TLT181K999G	PEAKING COIL 180U
C 1256	ECKF1H103ZF	C 0.01UF, Z, 50V	L 501	TSC909	BEAD CHOKE
C 1259	ECQM1H683KZ	P 0.068UF, K, 50V	L 510	TLT082K126C	PEAKING COIL 8.2U
C 1260	ECQM1H104KZ	P 0.1UF, K, 50V	L 552	TLT682-109	PEAKING COIL 6.8M
C 1261	ECQM1H273KZ	P 0.027UF, K, 50V	L 553	TLH6667P	H.LIN. TRANS.
C 1262	ECQM1H103KZ	P 0.01UF, K, 50V	L 601	TLT270J991K	PEAKING COIL 27U
C 1264	ECQM1H823KZ	P 0.082UF, K, 50V	L 602	TLT022K991K	PEAKING COIL 2.2U
C 1267	ECQM1H154KZ	P 0.15UF, K, 50V	L 603	TLT681K999G	PEAKING COIL 680U
C 1271	ECEA1EN4R7S	E 4.7UF, 50V	L 604	TLT681K999G	PEAKING COIL 680U
C 1272	ECEA1CS101	E 100UF, 16V	L 605	TLT681K999G	PEAKING COIL 680U
C 1273	ECEA1HS100	E 10UF, 50V	L 606	TLT681K999G	PEAKING COIL 680U
C 1274	ECEA1ES221	E 220UF, 25V	L 607	TLT542K999G	PEAKING COIL 5.4M
C 1275	ECEA1CS470	E 47UF, 16V	L 608	TLT180K991K	PEAKING COIL 18U
C 1276	ECKF1H103ZF	C 0.01UF, Z, 50V	L 609	TLT330K991K	PEAKING COIL 33U
C 1277	ECEA1CS100	E 10UF, 16V	L 610	TLK68073-1	COIL
C 1278	ECKF1H103ZF	C 0.01UF, Z, 50V	L 611	TLK68072-1	COIL
C 1279	ECEA1CN470S	E 47UF, 16V	L 612	TLT681K999G	PEAKING COIL 680U
C 1282	ECKF1H103ZF	C 0.01UF, Z, 50V	L 613	TLT681K999G	PEAKING COIL 680U
	COILS		L 614	TLT681K999G	PEAKING COIL 680U
			L 615	TLT681K999G	PEAKING COIL 680U
L 51	TLT101K999G	PEAKING COIL 100U	L 616	TLT681K999G	PEAKING COIL 680U
L 103	TLT150K999G	PEAKING COIL 15U	L 617	TLT681K999G	PEAKING COIL 680U
L 104	TLI151757	VIDEO IF TRANS	L 618	TLT681K999G	PEAKING COIL 680U
L 130	TLT151K999G	PEAKING COIL 150U	L 619	TLT681K999G	PEAKING COIL 680U
L 131	TLT151K999G	PEAKING COIL 150U	L 620	TLT047K991K	PEAKING COIL 4.7U
L 133	TLI152654	VIDEO IF TRANS	L 621	TLT560K991K	PEAKING COIL 56U
L 134	TLT151K999G	PEAKING COIL 150U	L 622	EFDEN645A01A	DELAY LINE, CHROMA
L 135	TLT151K999G	PEAKING COIL 150U	L 801	TLP6505-2P	LINE FILTER COIL
L 151	TLI157754	VIDEO IF TRANS.	L 802	TLR69452	CHOKE COIL
L 170	TLI767950	VIDEO IF TRANS.	L 803	TLT100K999G	PEAKING COIL 10U
L 201	TLS153255	AUDIO IF TRANS.	L 831	TLP408	CHOKE COIL
L 270	TLT151K991K	PEAKING COIL 150U	L 832	TLP408	CHOKE COIL
L 271	TLT151K991K	PEAKING COIL 150U	L 834	TLP408	CHOKE COIL
L 272	TLT122K999G	PEAKING COIL 220U	L 835	TLP408	CHOKE COIL

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
L 836	TLP408	CHOKE COIL	D 501	TVSQA111SE	ZENER DIODE
L 837	TLP408	CHOKE COIL	D 551	MA26W0	DIODE
L 838	TSC909	BEAD CHOKE	D 552	TVSQA111SE	ZENER DIODE
L 840	TLP408	CHOKE COIL	D 553	TVSRM1ZM	DIODE
L 1201	TLQ470K205C	PEAKING COIL 47U	D 554	TVSRU2	DIODE
L 1251	TSC925-4	CHOKE COIL	D 555	TVSRU2	DIODE
	TRANSFORMERS		D 556	TVSRC2	DIODE
T 130	TLI153754	TRAP COIL	D 601	MA161	DIODE
T 131	TLI153755	TRAP COIL	D 602	MA161	DIODE
T 251	ETA19Z18AY	EARPHONE TRANS.	D 603	MA56	DIODE
T 501	TLH6476E	H.DRIVE TRANS.	D 604	OA91	DIODE
T 551	TLF14612B1	FLYBACK TRANS.	D 605	MA161	DIODE
T 601	TLK151053	CHROMA IF TRANS.	D 606	MA161	DIODE
T 602	TLK63117	CHROMA TRANS.	D 607	MA161	DIODE
T 751	TLH6794E	SIDE PCC TRANS.	D 608	MA161	DIODE
T 801	TLH6476E	H.DRIVE TRANS.	D 609	MA161	DIODE
T 831	TLP15764	TRANS.	D 610	MA161	DIODE
	DIODES		D 751	MA150	DIODE
D 130	MA56	DIODE	D 801	TVSMI15SC	DIODE
D 131	MA56	DIODE	D 802	TVSMI15RC	DIODE
D 132	MA56	DIODE	D 804	MA150	DIODE
D 170	MA56	DIODE	D 805	TVSQA110S	ZENER DIODE
D 171	MA150	DIODE	D 806	TVSQA106SB	ZENER DIODE
D 232	TVSQB106R	ZENER DIODE	D 807	MA150	DIODE
D 233	TVSQB106R	ZENER DIODE	D 808	TVSRU2	DIODE
D 270	MA161	DIODE	D 809	TVSRU2	DIODE
D 271	MA161	DIODE	D 810	TVSRU1	DIODE
D 272	MA161	DIODE	D 811	ERPF5BOM120G	POSISTOR
D 273	MA56	DIODE	D 812	ERZC10DK621	VARISTOR
D 274	MA56	DIODE	D 813	TVSRM1ZM	DIODE
D 275	MA150	DIODE	D 814	TVSRM1ZM	DIODE
D 276	TVSQA120R	ZENER DIODE	D 815	TVSRM1ZM	DIODE
D 301	MA161	DIODE	D 816	TVSRM1ZM	DIODE
D 303	MA150	DIODE	D 817	MA150	DIODE
D 304	MA1130	ZENER DIODE	D 818	MA150	DIODE
D 305	MA1130	ZENER DIODE	D 831	TVSRU2	DIODE
D 306	MA1130	ZENER DIODE	D 832	TVSC2404	DIODE
D 406	MA150	DIODE	D 833	TVSRU1	DIODE
D 407	MA150	DIODE	D 1001	LN66	DIODE
D 408	MA150	DIODE	D 1002	LN66	DIODE
D 409	TVSRM1ZM	DIODE	D 1201	LN31GCP-UHL	DIODE
D 410	OA91	DIODE	D 1202	LN31GCP-UHL	DIODE
			D 1203	LN31GCP-UHL	DIODE
			D 1204	LN31GCP-UHL	DIODE
			D 1205	LN31GCP-UHL	DIODE
			D 1206	LN31GCP-UHL	DIODE

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
D 1207	LN31GCP-UHL	DIODE	Q 751	2SC1383	TRANSISTOR
D 1208	LN31GCP-UHL	DIODE	Q 801	2SD792-S	TRANSISTOR
D 1209	LN31GCP-UHL	DIODE	Q 802	2SC2085	TRANSISTOR
D 1210	LN31GCP-UHL	DIODE	Q 803	2SC1573B	TRANSISTOR
D 1211	LN31GCP-UHL	DIODE	Q 804	2SC1819M	TRANSISTOR
			Q 805	2SC1684-Q	TRANSISTOR
D 1212	LN31GCP-UHL	DIODE	Q 1001	2SC1684-Q	TRANSISTOR
D 1214	MA150	DIODE	Q 1002	2SC1317-R	TRANSISTOR
D 1215	MA150	DIODE	Q 1201	2SA564A-RS	TRANSISTOR
D 1216	MA150	DIODE	Q 1202	2SA564A-RS	TRANSISTOR
D 1217	MA1051	ZENER DIODE	Q 1203	2SA564A-RS	TRANSISTOR
			Q 1204	2SA564A-RS	TRANSISTOR
D 1251	MA150	DIODE	Q 1205	2SA719	TRANSISTOR
D 1252	MA1240L	ZENER DIODE	Q 1206	2SC1685-R	TRANSISTOR
D 1253	MA150	DIODE	Q 1208	2SC1685-R	TRANSISTOR
D 1257	MA150	DIODE	Q 1209	2SA564A-RS	TRANSISTOR
D 1260	TVSGRU2A	DIODE			
	I.C			OTHERS	
IC 101	AN5132	IC (VIF,ML,AFC)		EAS10P133S	SPEAKER
IC 201	AN5250	IC (AUDIO,SIF)		TBX1582403	CHANNEL KNOB
IC 501	AN5435	IC (V.H-QSC SYNC)		TBX17535-2	KNOB
IC 502	TVSUPD4066BC	I.C		TBX17598	KNOB,V-HOLD
IC 601	TVSUPC1384C	I.C		TBX17599	KNOB
IC 602	TVSUPD4066BC	I.C			
IC 801	AN5900	IC (SW-REG)		TBX1763300	KNOB
IC 1001	MN6027A	IC		TBX643800	UP/DOWN SW KNOB
IC1201	MN1411TX	IC		TES5201	SPRING
IC1202	MN1212A	IC		TES8141	TR MOUNT SPRING
IC1203	AN5031	IC		THE544S	SCREW
	TRANSISTORS			THN1994-2S	NUT
Q 102	2SC1685-R	TRANSISTOR		TJB721700	ANT. TERMINAL
Q 170	2SC1685-R	TRANSISTOR		TJC6320	FUSE HOLDER
Q 270	2SC1685-R	TRANSISTOR		TJS168041	4P SHORT PLUG
Q 303	2SC1685-R	TRANSISTOR		TJS168051	5P SHORT PLUG
Q 351	2SC2258	TRANSISTOR		TJS168061	6P SHORT PLUG
Q 352	2SC2258	TRANSISTOR		TJS168440	3P SHORT PLUG
Q 353	2SC2258	TRANSISTOR		TJS35030	CRT SOCKET
Q 401	2SC2481	TRANSISTOR		TJS37010	EARPHONE SOCKET
Q 402	2SC2481	TRANSISTOR		TJS38100	2P ADAPTOR
Q 403	2SC2481	TRANSISTOR			
Q 501	2SC1573AH	TRANSISTOR		TKK159386	FILM HOLDER
Q 551	2SD951	TRANSISTOR		TKK160543	PLASTIC LEG
Q 552	2SD762M	TRANSISTOR		TKK170690	BRACKET
Q 601	2SC1685-R	TRANSISTOR		TKK179375	CHANNEL FILM
Q 602	2SA564A-RS	TRANSISTOR		TKK179385	FILM
				TKK179388	CHANNEL FILM
				TKK69248	HANDLE
				TKK69514-4	CRT PROTECT COVER

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
	TKU124102	REAR COVER, TOP	CO 60	TZS9014	1P COUPLER KIT
	TKU219001	REAR COVER	CO 82	TZS9001	4P COUPLER KIT
	TLC2024-2S	CONVERGENCE YOKE	CO 93	TXAJT93LZER	CONNECTOR
	TLK159079-1	DEGAUSSING COIL	CO 94	TXAJT94LZER	CONNECTOR
	TLY5383F	DEFLECTION YOKE	CO 95	TXAJT95LZER	CONNECTOR
	TMM15202	CRT SOCKET COVER	CO 96	TXAJT96LZER	CONNECTOR
	TMM15525	RUBBER CUSHION	CO 97	TXAJT97LZER	CONNECTOR
	TMM17514	DY WEDGE	CO 98	TXAJT98LZER	CONNECTOR
	TMZ179808-1	CHASSIS GUIDE (R)	F 801	XBA2C315TR0	FUSE 250V 3.15A
	TMZ179809	CHASSIS GUIDE (L)	N 551	XANT343	NEON LAMP
	TNP55994DB	CIRCUIT BOARD Y	S 301	ESD7022	SWITCH
	TNP56050ZA	CIRCUIT BOARD W	S 601	ESB7167	SWITCH
	TNP56051	CIRCUIT BOARD M	S 602	ESB7167	SWITCH
	TNP62452ZA	CIRCUIT BOARD B	S 1201	EVQQ8R13K	SWITCH
	TNP62458ZA	CIRCUIT BOARD Q	S 1202	EVQQ8R13K	SWITCH
	TNV79725F2	UHF TUNER	S 1203	EVQQ8R13K	SWITCH
	TPD191165	CUSHION	S 1204	EVQQ8R13K	SWITCH
	TPD192171	CUSHION	S 1205	EVQQ8R13K	SWITCH
	TPE14752	SET COVER	S 1206	EVQQ8R13K	SWITCH
	TSX1143	POWER SUPPLY CORD	S 1207	EVQQ8R13K	SWITCH
	TXG100LZE	CABINET	S 1208	EVQQ8R13K	SWITCH
	XEH3B1	EARPHONE	S 1209	EVQQ8R13K	SWITCH
	XFMK0148G	MAGNET	S 1210	EVQQ8R13K	SWITCH
	XTB4+15A	SCREW	S 1211	EVQQ8R13K	SWITCH
	XTV4+15B	SCREW	S 1212	EVQQ8R13K	SWITCH
	XWG6J20	WASHER	S 1213	ESD7022	SWITCH
	510WXB22	PICTURE TUBE	S 1214	EVQQHR12B	SWITCH
CO 05	TZS9023	4P CONNECTOR KIT	S 1215	EVQQHR12B	SWITCH
CO 11	TXAJT11LZER	CONNECTOR	X 102	EFCS5R5MW3	CERAMIC TRAP
			X 103	EFCA4R5MB3	CERAMIC TRAP
CO 12	TXAJT12LZER	CONNECTOR	X 170	EFCA6R0MB3	CERAMIC TRAP
CO 15	TXAJT15LZER	CONNECTOR	X 270	EFCS4R5MS4E	CERAMIC TRAP
CO 16	TXAJT16LZER	CONNECTOR	X 271	EFCS5R5MS3	CERAMIC FILTER
CO 17	TXAJT17LZER	CONNECTOR	X 272	EFCS6R0MS3	SOUND FILTER
CO 18	TXAJT18LZER	CONNECTOR	X 601	EFCA5R5MB3	CERAMIC TRAP
CO 22	TXAJT22LZER	CONNECTOR	X 602	EFCA4R5MB3	CERAMIC TRAP
CO 25	TXFJT25LZE	CONNECTOR, CO-25	X 603	TSS116M1	CRYSTAL
CO 26	TXFJT26LZE	CONNECTOR, CO-26	X 604	TSS816M	CRYSTAL OSCILATOR
CO 27	TXFJT27LZE	CONNECTOR, CO-27	X 1001	TFCA455K91	CRYSTAL OSCILLATOR
CO 31	TXAJT31LZER	CONNECTOR, CO-31			
CO 32	TXAJT32LZER	CONNECTOR			
CO 40	TXAJT40LZER	CONNECTOR			
CO 42	TZS9014	1P COUPLER KIT			
CO 48	TZS9014	1P COUPLER KIT			

TC-214NP ONLY

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
D 1213	DIODES				
	LN31GCP-UHL	DIODE			
CO 21	OTHERS				
	TBM37294	MODEL NAME PLATE			
	TKE178704-1	ESCUTCHEON			
	TKP1718602-1	PANEL			
	TKP1718613-1	DOOR PANEL			
	TNP560492B	CIRCUIT BOARD			
	TNP56052	CIRCUIT BOARD			
	TNP62847DF	CIRCUIT BOARD			
	TPC394571	OUTER CARTON			
	TQB610627	INSTRUCTION BOOK			
	TXAJT21LZE	CONNECTOR, CO-21			

TC-214NPR ONLY

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
RESISTORS					
R 1101	ERD25TJ683	C 68KOHM, J, 1/4W	R 1152	ERD25TJ223	C 22KOHM, J, 1/4W
R 1102	ERD25TJ272	C 2.7KOHM, J, 1/4W	R 1153	ERD25TJ102	C 1KOHM, J, 1/4W
R 1110	ERD25TJ221	C 220OHM, J, 1/4W	R 1154	ERD25TJ101	C 100OHM, J, 1/4W
R 1111	ERD25TJ560	C 56OHM, J, 1/4W	R 1155	ERD25TJ103	C 10KOHM, J, 1/4W
R 1112	ERD25TJ154	C 150KOHM, J, 1/4W	R 1156	ERD25TJ333	C 33KOHM, J, 1/4W
R 1113	ERD25TJ104	C 100KOHM, J, 1/4W	R 1157	ERD25TJ102	C 1KOHM, J, 1/4W
R 1114	ERD25TJ103	C 10KOHM, J, 1/4W	CAPACITORS		
R 1115	ERD25TJ103	C 10KOHM, J, 1/4W	C 1101	ECKF1H681KB	C 680PF, K, 50V
R 1116	ERD25TJ223	C 22KOHM, J, 1/4W	C 1102	ECEA1HS3R3	E 3.3UF, 50V
R 1117	EVLT3MA00B34	CONTROL 30KOHMB	C 1110	ECEA1CS220	E 22UF, 16V
R 1118	ERD25TJ562	C 5.6KOHM, J, 1/4W	C 1111	ECEA1ES4R7	E 4.7UF, 25V
R 1119	ERD25TJ153	C 15KOHM, J, 1/4W	C 1112	ECEA1CS100	E 10UF, 16V
R 1120	ERD25TJ103	C 10KOHM, J, 1/4W	C 1113	ECQP1332JZ	P 3300PF, J, 100V
R 1121	ERD25TJ104	C 100KOHM, J, 1/4W	C 1114	ECQM1H333KZ	P 0.033UF, K, 50V
R 1122	ERD25TJ102	C 1KOHM, J, 1/4W	C 1115	ECQM1H104KZ	P 0.1UF, K, 50V
R 1123	ERD25TJ272	C 2.7KOHM, J, 1/4W	C 1118	ECKF1H103ZF	C 100PF, K, 50V
R 1124	ERD25TJ102	C 1KOHM, J, 1/4W	C 1119	ECEA1CS100	E 10UF, 16V
R 1125	ERD25TJ103	C 10KOHM, J, 1/4W	C 1120	ECEA1ES4R7	E 4.7UF, 25V
R 1126	ERD25TJ562	C 5.6KOHM, J, 1/4W	C 1121	ECEA1ES4R7	E 4.7UF, 25V
R 1127	ERD25TJ223	C 22KOHM, J, 1/4W	C 1122	ECEA1ES4R7	E 4.7UF, 25V
R 1128	ERD25TJ563	C 56KOHM, J, 1/4W	C 1123	ECKF1H103ZF	C 0.01UF, Z, 50V
R 1129	ERD25TJ563	C 56KOHM, J, 1/4W	C 1124	ECKF1H103ZF	C 0.01UF, Z, 50V
R 1130	ERD25TJ223	C 22KOHM, J, 1/4W	C 1125	ECKD2H102PE	C 1000PF, P, 500V
R 1131	ERD25TJ562	C 5.6KOHM, J, 1/4W	C 1126	ECKD2H102PE	C 1000PF, P, 500V
R 1132	ERD25TJ222	C 2.2KOHM, J, 1/4W	C 1127	ECKD2H102PE	C 1000PF, P, 500V
R 1133	ERD25TJ272	C 2.7KOHM, J, 1/4W	C 1128	ECEA1ES471	E 470UF, 25V
R 1134	ERD25TJ472	C 4.7KOHM, J, 1/4W	C 1129	ECKF1H101KB	C 0.01UF, Z, 50V
R 1135	ERD25TJ330	C 33OHM, J, 1/4W	C 1130	ECEA1AS221	E 220UF, 10V
R 1136	ERD25TJ562	C 5.6KOHM, J, 1/4W	C 1134	ECEA1HS010	E 1UF, 50V
R 1137	ERD25TJ123	C 12KOHM, J, 1/4W	C 1135	ECEA1CS100	E 10UF, 16V
R 1138	ERD25TJ121	C 120OHM, J, 1/4W	C 1136	ECEA1CS100	E 10UF, 16V
R 1139	ERD25TJ103	C 10KOHM, J, 1/4W	C 1137	ECKF1H103ZF	C 0.01UF, Z, 50V
R 1140	ERD25TJ121	C 120OHM, J, 1/4W	COILS		
R 1141	ERD25TJ822	C 8.2KOHM, J, 1/4W	L 306	TLT056K991K	PEAKING COIL
R 1142	ERD25TJ333	C 33KOHM, J, 1/4W	L 1101	TLQ100K126C	PEAKING COIL 10U
R 1143	ERD25TJ222	C 2.2KOHM, J, 1/4W	TRANSFORMERS		
R 1144	ERD25TJ332	C 3.3KOHM, J, 1/4W	T 1111	TLR69720	OSC TRANS.
R 1145	ERD25TJ221	C 220OHM, J, 1/4W	T 1112	TLP15288	TRANSFORMER
R 1146	ERD50FJ121	C 120OHM, J, 1/2W			
R 1147	ERG2ANJ681H	M 680OHM, J, 2W			
R 1148	ERG2ANJ102H	M 1KOHM, J, 2W			
R 1151	ERD25TJ473	C 47KOHM, J, 1/4W			

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
	DIODES				
D 1101	TVSPH302	DIODE		TNP56049ZA	CIRCUIT BOARD U
D 1112	MA150	DIODE		TNP56053	CIRCUIT BOARD N
D 1113	MA150	DIODE		TNP62847CE	CIRCUIT BOARD E
D 1115	TVSS1WB10	RECTIFIER		TNQ1652	TRANSMITTER
D 1116	TVSRD4.7EB3	ZENER DIODE		TPC394561	OUTER CARTON
D 1117	TVSQA112R	ZENER DIODE		TQB610632	FAN BAG
D 1118	TVSQA105T	ZENER DIODE	R 1	TXAJTR1LZER	CONNECTOR
D 1122	MA27W	DIODE	CO 21	TXAJT21LZER	CONNECTOR
D 1213	TVSSLP530A	DIODE	CO 41	TXAJT41LZER	CONNECTOR
			CO 43	TZS9014	1P COUPLER KIT
			CO 44	TXAJT44LZER	CONNECTOR
			CO 45	TXAJT45LZER	CONNECTOR
			CO 49	TXAJT49LZER	CONNECTOR
	I.C				
IC1111	TVSUPC1373H	IC			
IC1112	MN1403TN	IC			
	TRANSISTORS				
Q 1111	2SC1684-Q	TRANSISTOR			
Q 1112	2SC1684-Q	TRANSISTOR			
Q 1113	2SC1684-Q	TRANSISTOR			
Q 1114	2SC1684-Q	TRANSISTOR			
Q 1115	2SC1684-Q	TRANSISTOR			
Q 1116	2SC1685-S	TRANSISTOR			
Q 1117	2SC1684-Q	TRANSISTOR			
Q 1118	2SC1684-Q	TRANSISTOR			
Q 1119	2SC1685-R	TRANSISTOR			
Q 1120	2SC1573A	TRANSISTOR			
Q 1121	2SD762M	TRANSISTOR			
Q 1122	2SC1685-R	TRANSISTOR			
	OTHERS				
	TBM37293	MODEL NAME PLATE			
	TEG36557-1	UPPER CASE			
	TEG36558-1	BOTTOM CASE			
	TEG36559-6	BATTERY COVER			
	TKE178704-2	ESCUTCHEON			
	TKK179389	CH. FILM			
	TKP1616861	PANEL			
	TKP1617251	SMOKED PANEL			
	TKP1718602-2	PANEL			
	TKP1718614-1	DOOR PANEL			
	TKP1753911	ALUMINUM PANEL			
	TMM15552	CONTACT RUBBER			
	TNP12937	CIRCUIT BOARD R			
	TNP12981ZA	CIRCUIT BOARD T			